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WAGE EARNING AND EDUCATION

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WAGE EARNING AND EDUCATION

BY

R. R. LUTZ

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E.P.

FOREWORD

This summary volume, entitled "Wage Earning and Education," is one of the 25 sections of the report of the Education Survey of Cleveland conducted by the Survey Committee of the Cleveland Foundation in 1915 and 1916. Copies of all the publications may be obtained from the Cleveland Foundation. They may also be obtained from the Division of Education of the Russell Sage Foundation, New York City. A complete list will be found in the back of this volume, together with prices.

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WAGE EARNING AND EDUCATION

CHAPTER I

THE INDUSTRIAL EDUCATION SURVEY

The education survey of Cleveland was undertaken in April, 1915, at the invitation of the Cleveland Board of Education and the Survey Committee of the Cleveland Foundation, and continued until June, 1916. As a part of the work detailed studies were made of the leading industries of the city for the purpose of determining what measures should be taken by the public school system to prepare young people for wage-earning occupations and to provide supplementary trade instruction for those already in employment. The studies also dealt with all forms of vocational education conducted at that time under public school auspices.

Types of Occupations Studied

Separate studies were made of the metal industry, building and construction, printing and publishing, railroad and street transportation, clothing manufacture, department store work, and clerical occupations. The wage-earners in these fields of employ-

ment constitute nearly 60 per cent of the total number of persons engaged in gainful occupations and include 95 per cent of the skilled workmen in the city. The survey also gave considerable attention to the various types of semi-skilled work found in the principal industries.

Each separate study was assigned to a particular member of the Survey Staff who personally carried on the field investigations and later submitted a report to the director of the survey. Each report was also subjected to careful analysis and criticism from other members of the Survey Staff before it was finally passed upon by the Survey Committee. Mimeographed copies were sent to representatives of the industry and to the superintendent of schools and members of the school board and their criticisms and suggestions were given careful consideration before the Committee and the director of the survey gave their final approval to the publication of the report. The value of the work was greatly enhanced through the ample discussion of the different studies from widely diverse points of view secured in this way. The industrial studies were carried through under the direction of the author of this summary volume.

The Survey Staff and Methods of Work

The reports of the studies relating to vocational education were published in a series of eight separate monograph volumes. The names of the reports and

the previous experience in educational and investigational work of each member of the Survey Staff are as follows:

"Boys and Girls in Commercial Work"—Bertha M. Stevens; teacher in elementary and secondary schools; agent of Associated Charities; secretary of Consumers' League of Ohio; director of Girls' Bureau of Cleveland; author of "Women's Work in Cleveland"; co-author of "Commercial Work and Training for Girls."

"Department Store Occupations"—Iris P. O'Leary; head of manual training department, First Pennsylvania Normal School; head of vocational work for girls and women, New Bedford Industrial School; head of girls' department, Boardman Apprentice Shops, New Haven, Conn.; special investigator of department stores for New York State Factory Investigating Commission; three years' trade experience as employer and employe; author of books on household arts and department stores; Special Assistant for Vocational Education, State Department of Public Instruction, New Jersey.

"The Garment Trades" and "Dressmaking and Millinery"—Edna Bryner; teacher in grades, high school, and state normal college; eugenic research worker New Jersey State Hospital; statistical expert in United States Bureau of Labor Investigation of women and child labor; statistical agent United States Post Office Department; Special Agent Russell Sage Foundation.

"The Building Trades," and "The Printing Trades"—Frank L. Shaw; teacher in grades and high school; principal of high school; assistant superintendent of schools; superintendent of schools; special agent

United States Immigration Commission; special agent United States Census; industrial secretary North American Civic League for Immigrants; author of reports on immigration legislation.

"The Metal Trades"—R. R. Lutz; teacher in rural and graded schools; superintendent of schools; secretary of Department of Education of Porto Rico; took part in school surveys of Greenwich, Conn., Bridgeport, Conn., Springfield, Ill., Richmond, Va.; Special Agent Division of Education, Russell Sage Foundation.

"Railroad and Street Transportation"—Ralph D. Fleming; special agent and investigator for United States Immigration Commission, the Federal Census of Manufacturers, the United States Tariff Board, the Minimum Wage Commission of Massachusetts, the National Civic Federation, and the United States Commission on Industrial Relations.

The work began in April, 1915, and ended in the same month of the following year. Two members of the staff, with one stenographer and a clerk, were employed during the entire period. One member of the staff was employed 11 months, one nine months, one approximately five months, and one two months.

The field investigations consisted largely of visits to industrial establishments for the purpose of securing first-hand information as to industrial conditions and the nature and educational content of particular occupations. Over 400 visits of this kind were made by members of the Survey Staff. Many conferences were held with employers and employees with the object of securing their views as to the needs and possibilities of industrial training.

The task of tabulating and classifying the data obtained by the individual investigators in their visits to the local industrial establishments involved much time and labor. Although it was not found practicable to maintain complete uniformity in the different inquiries, the members of the staff kept in close touch with each other, so that with respect to the points of principal importance, the results of their investigations are comparable. Practically every recommendation made in the reports was discussed in conferences with school principals and with other members of the teaching force engaged in the teaching of vocational subjects.

Throughout the survey the objective held constantly in mind was the formulation of a constructive program of vocational training in the public schools. In outlining the field of inquiry a clear distinction was drawn between those kinds of general education which have a more or less indirect vocational significance, and vocational training for specific occupations in which the controlling purpose is direct preparation for wage-earning. The studies were purposely limited to this latter type of vocational training. The survey did not concern itself with manual training conducted for general educational ends, with the art work of the schools, or with courses in domestic science and household arts. These subjects in the curriculum were dealt with in different sections of the education survey, but were considered as being outside the legitimate field of the vocational survey.

CHAPTER II

FORECASTING FUTURE PROBABILITIES

The industrial education survey of Cleveland differs from other studies conducted elsewhere in that it bases its educational program on a careful study of the probable future occupational distribution of the young people now in school. It does not claim to foretell the specific positions that individual boys and girls will hold when they are adults but it does claim very definitely that our safest guide in foretelling their future vocational distribution is to be found in the official figures of the present occupational census of the city.

One of the most familiar and time-worn platitudes of educational speakers and writers is that "The children of today are the citizens of tomorrow." In the field of industrial education it is quite as true that the school children of today are the workers of tomorrow. Moreover, since occupational distributions change but slowly even in these modern times, it is unquestionably true that the boys and girls now studying in the public schools will soon be scattered among the different gainful occupations of Cleveland's industrial, commercial, and professional life in just about the same proportions as their

fathers and mothers and brothers and sisters are now distributed.

The plan of the survey in advocating types of present preparation based on studies of future prospects seems at first sight so obvious a mode of procedure as hardly to warrant extended explanation. This is far from being the case. The reader who proposes to follow the working-out of the principle and to scrutinize the evidence underlying it must be prepared to scan many a detailed table of statistics and to arrive at most unforeseen conclusions.

The Popular Concept of Industrial Education

For many years past the public has given respectful attention to the arguments of the champions of industrial education. There has been general assent to the proposition that the schools should train for and not away from the industrial age in which we live. We have come to think of the carpenter shop, the machine shop, the forge shop, and the cooking room as necessary and desirable adjuncts of the modern school and to our minds these shops have typified industrial education. All of these have come to be almost synonymous with progressive thought and action in public education. Very generally it has been felt that the problems of industrial education were to be solved through the wider extension of these shop facilities in our public schools.

When these familiar generalizations are submitted

to careful analysis their whole structure begins to totter. In Cleveland about 3,700 boys leave school each year and go to work. They represent various stages of advancement from the 4th grade of the elementary school to the 4th year of the high school. They are scattered through more than 100 school buildings. The problem of industrial education is to give these boys with their differing ages, their widely varied school preparation, and their scattered geographical distribution, the best possible preparation for taking their places in the work-a-day world. They represent every grade of intelligence, every stratum of social and economic life, and it is extremely difficult to bring them together for instructional purposes. They are scattered in little groups through more than a thousand classrooms.

The Importance of Relative Numbers

Now it is possible to foretell with some certainty what these young people will be doing a few years from now. Almost all of them are of American birth and it is certain that in a few years they will be engaged in doing just about the same sorts of work as are now done in the city of Cleveland by adults of American birth. The data of the United States Census of Occupations show us that among every 100 American born men in Cleveland there are eight who are clerks, seven who are machinists, four who are salesmen, and so on through the list of hundreds of occupations. The number of American born men in

each 100 engaged in each of the 10 leading sorts of occupations is approximately as follows:

Clerks	8
Machinists	7
Salesmen	4
Laborers and porters	4
Retail dealers	4
Draymen, teamsters, etc	4
Bookkeepers	3
Carpenters	3
Commercial travelers	2
Manufacturers	2
	41

This simple list at once calls into question all the standard assumptions about the extension of industrial education depending on greatly increasing the number of carpenter shops and machine shops in the public schools. The figures show that among each 100 American born men in Cleveland only seven are machinists and only three are carpenters. Clearly we should not be justified in training all the boys in our public schools to enter the machinist's trade or the carpenter's trade when nine out of each 10 will in all probability engage in entirely different sorts of future work. The more the figures of the little table given above are studied, the clearer it appears that our conventional ideas about industrial education need critical scrutiny and careful challenge. These 10 leading occupations include only 41 out of each 100 American born men. Moreover, more than half of these 41 are engaged in mental work rather than in manual work.

From these considerations one definite conclusion inevitably emerges. It is that the safest guide for thinking and planning for industrial education is to be found in a study of the occupational distribution of the present adults. From the very outset such a study indicates that the most difficult and important problems which must be met and coped with are not those relating to methods of instruction but rather those of organization and administration. The future carpenters and machinists cannot be taught until we can get them together in fair sized classes. They represent the most numerous of the industrial groups and yet their numbers are relatively so few that the average Cleveland school sends out into the world each year only two or three future machinists and perhaps one future carpenter.

The trouble with present thinking about this matter has been that we have noted the very large numbers of machinists and carpenters in the population and have failed to realize that while these groups are numerous in the aggregate they are after all quite small when relatively considered and compared with the total number of workers.

Another important fact that has been almost invariably overlooked is that many of the present carpenters and machinists are foreigners by birth and that there is every prospect that this same condition will maintain in the future. Hence these trades and most other industrial occupations are not recruited from our public schools to anything like the degree that has been assumed.

A Constructive Program Must Fit the Facts

The simple principle which underlies the method employed by the survey is the same on which all large business undertakings are conducted. The results of its application in the field of industrial education are, however, fundamentally different from those commonly arrived at on the assumption that nine-tenths of the rising generation will earn their living in industrial pursuits. The fact is that no such proportion of the children in school will become industrial workers. All the native born labor now employed in manufacturing and mechanical industries constitutes only 44 per cent of the total number of native born workers in the city. Moreover, nearly half of the industrial workers are employed in unskilled and semi-skilled occupations for which no training is required beyond a few days' or weeks' practice on the job. Such training calls for a mechanical equipment far more extensive than the resources of the school system can provide, and can be given by the factory more effectively and much more cheaply than by the schools.

In the final analysis, the problem of industrial training narrows down to the skilled industrial trades. Approximately 22 per cent of the total number of American workers in the city are employed in skilled manual occupations. This does not mean that a constructive program of industrial education would affect 22 per cent of the present school enrollment. All the weight of educational opinion and experience is on the side of excluding the children

of the lower and middle age groups as too young to profit by any sort of industrial training, while the evidence collected by the survey goes to show that of the remainder less than one-fifth of the girls and one-fourth of the boys are likely to become skilled industrial workers.

An Actuarial Basis for Industrial Education

Considerations like the foregoing have determined the fundamental method of the Cleveland Industrial Survey. Plans for the present generation have been formulated on the basis of future prospects as foretold by state and federal census data. The methods used were characterized by a member of the Cleveland Foundation Survey Committee as "the actuarial basis of vocational education." This is accurately descriptive, because the method of forecasting the number of men the community will need for each wage-earning occupation closely resembles that employed by life insurance actuaries in foretelling how long men of different ages are likely to live. Such methods are similar to those commonly used in commerce and industry. They deal with mass data rather than with individual figures, and with relative values rather than with absolute ones.

CHAPTER III

THE WAGE EARNERS OF CLEVELAND

In 1910 Cleveland ranked sixth among the cities of the United States as to number of inhabitants, with a population of approximately 561,000. The city is growing rapidly. From 1900 to 1910 the increase in the total number of inhabitants was over 46 per cent. The Census Bureau estimate of the population in 1914 is approximately 639,000.

Of the 10 largest cities in the country only one—Detroit—had in 1910 a greater proportion of its wage earners engaged in industrial employment than Cleveland. Relatively Cleveland has one and one-fourth times as many industrial workers as New York, Chicago, St. Louis, or Baltimore, and one and two-fifths times as many as Boston. On the other hand a smaller proportion of the adult workers of the city earn their living in professional, clerical, and commercial work, or in domestic and personal service employments than in most large cities.

Table 1 shows by large occupational groups the distribution in 1910 of the working population in Cleveland. The classification is that adopted by the federal census. More than 56 per cent of the male workers of the city and about 33 per cent of the

women workers were engaged in manufacturing and mechanical occupations. The trade group ranks next, about 14 per cent of the men and approximately 11 per cent of the women being engaged in commercial occupations. Of each 100 women in employment 30 are servants, laundresses, housekeepers, or are engaged in some other form of personal service, while only five men of each 100 earn their living in this kind of work. Railroad and street transportation, with the telegraph and telephone and mail systems of communication, requires the services of 11 per cent of the male working population, but uses very few women. About seven per cent of the men and 15 per cent of the women are employed in clerical work. A slightly larger ratio of women to men is found in the professional occupations, due mainly to the large number of women in the teaching profession. The whole professional group constitutes less than five per cent of the total working population.

TABLE 1.—OCCUPATIONAL DISTRIBUTION OF THE WORKING POPULATION OF CLEVELAND, CENSUS OF OCCUPATIONS, 1910

Occupational group	Men	Women	Total
Manufacturing and mechanical industries	109,644	18,201	127,845
Trade	27,229	5,942	33,171
Domestic and personal service	9,546	16,467	26,063
Transportation	21,530	1,110	22,640
Clerical occupations	14,047	8,100	22,147
Professional service	7,204	4,869	12,073
Public service	3,461	39	3,500
Agriculture and extraction of minerals	1,367	80	1,447
Total	194,078	54,808	248,886

From the standpoint of vocational training one of the most striking facts about Cleveland wage-earners is that a large majority of them are not Clevelanders. Almost exactly half of the men in gainful employment were born outside the United States and, due to the rapid growth of the city, there has been a considerable influx of workers from the surrounding country in recent years, so that a large proportion even of the American working population was born, brought up, and educated in some other place. The number and per cent of foreign born, of foreign or mixed parentage but born in this country, and of native parentage is shown in Table 2.

TABLE 2.—NATIVITY OF THE WORKING POPULATION IN CLEVELAND. U. S. CENSUS, 1910

Nativity	Men		Women	
	Number	Per cent	Number	Per cent
Foreign born	96,291	50	16,673	31
Foreign or mixed parentage	55,074	28	24,275	44
Native parentage	42,713	22	13,860	25
Total	194,078	100	54,808	100

More than three-fourths are foreign or of foreign or mixed parentage. The proportion of those born in this country of American parentage is approximately the same for both sexes, but the number of women workers of mixed parentage is relatively much larger than among the men. Roughly, of each 10 men employed in gainful occupations, five, and of each 10 working women, three, were born abroad.

The large proportion of foreigners in the trades has an important bearing on the problem of vocational training. Some of the skilled occupations are monopolized by foreign labor to such an extent that they offer a very limited field of employment for native workmen. Cabinet making, tailoring, molding, blacksmithing, baking, and shoe making, are examples. Some of these trades have practically ceased to recruit from American labor. This condition has to be constantly borne in mind in planning training courses to prepare boys for the skilled trades, because of the marked disparity which often exists between the size of a trade and the field of opportunity it presents for boys of native birth.

CHAPTER IV

THE FUTURE WAGE-EARNERS OF CLEVELAND

In 1915 there were in Cleveland approximately 50,000 boys between the ages of six and 15, and 56,000 girls between the ages of six and 16, the age period during which school attendance is required by law. Of these 106,000 children approximately 37,000 boys and 38,000 girls were enrolled in the public schools. Exact data as to those attending private and parochial schools are not available. The total enrollment in such schools has been variously estimated as between 25,000 and 30,000.

The Public Schools

The public school system in 1915 enrolled approximately 82,000 children of all ages, of whom about half were boys and half girls. They are taught in 98 elementary schools and 10 high schools. The elementary course comprises eight grades. At the beginning of the school year 1915–16 two junior high schools were opened for pupils of the seventh and eighth grades. It is to be expected that this plan will soon be extended throughout the city, so that the

enrollment in elementary schools will be made up of pupils of the first six grades only. The distribution by grade is given in Table 3. The kindergarten grades and the special ungraded classes are omitted.

TABLE 3.—PUPILS ENROLLED IN THE DIFFERENT GRADES OF THE PUBLIC DAY SCHOOLS IN JUNE, 1915

Grade	Pupils
1	13,108
2	10,857
3	10,562
4	9,323
5	8,902
6	7,259
7	6,429
8	4,903
I	3,122
II	2,100
III	1,534
IV	1,399

About 77 per cent of the children are enrolled in the grades below the seventh, about 13 per cent in the seventh and eighth grades, a little over six per cent in the first two years of the high school, and less than three and one-half per cent in the third and fourth.

There are eight academic high schools, two technical high schools, and two commercial high schools. The technical high schools are steadily growing in favor. The registration of boys in these schools increased about 33 per cent from 1913 to 1915, and of girls about 77 per cent. During the same period the registration of boys in the academic high schools decreased slightly, while the increase of girl students was only eight per cent; in the commercial high

schools the number of girl students increased 20 per cent, while the enrollment of boys fell off more than 10 per cent. The enrollment by individual schools is shown in Table 4.

TABLE 4.—ENROLLMENT OF HIGH SCHOOL PUPILS, SECOND SEMESTER, 1914–15

Schools	Enrollment		
	Boys	Girls	Total
Academic high schools			
Central	804	711	1,515
East	607	688	1,295
Glenville	405	611	1,016
West	246	377	623
Lincoln	277	329	606
South	213	238	451
Total	2,552	2,954	5,506
Technical high schools			
East Technical	1,161	548	1,709
West Technical	515	242	757
Total	1,676	790	2,466
Commercial high schools			
West Commercial	249	528	777
East Commercial	49	96	145
Total	298	624	922
All high schools	4,526	4,368	8,894

About three-eighths of the high school pupils of the city are in the technical and commercial schools. Of the boys 56 per cent are enrolled in the academic high schools, 37 per cent in the technical schools, and

seven per cent in the commercial schools. Of the girls 68 per cent attend the academic high schools, 18 per cent the technical schools, and 14 per cent the commercial schools. In the commercial high school approximately two-thirds of the enrollment is made up of girls. In the technical high schools the opposite condition prevails, the girls constituting less than one-third of the total enrollment, while in the academic high schools the girls outnumber the boys by nearly one-sixth.

Ages of Pupils

The distribution as to ages is shown in Table 5. The largest group is made up of children seven years old. Between 14 and 15 over 30 per cent leave school. The loss from 16 to 17 is approximately 43 per cent, from 17 to 18 about 44 per cent, and from 18 to 19 nearly 62 per cent.

The compulsory attendance law requires boys to attend school until they are 15 and girls until they are 16. That the law is not adequately enforced is demonstrated by the heavy loss between the ages of 14 and 15, and the fact that the loss between 15 and 16 is approximately the same for both boys and girls, although girls are required to attend one year longer than boys. Additional evidence as to the laxity in the enforcement of the compulsory law is found in the results of an inquiry conducted by the Consumers' League of Cleveland in the spring of 1916, in cooperation with the survey.

TABLE 5.—AGES OF PUPILS ENROLLED IN PUBLIC ELEMENTARY, HIGH, AND NORMAL SCHOOLS IN JUNE, 1915

Age	Boys	Girls	Total
6	4,255	4,180	8,435
7	5,012	4,815	9,827
8	4,496	4,407	8,903
9	4,268	4,103	8,371
10	4,093	3,951	8,044
11	3,747	3,593	7,340
12	3,700	3,646	7,346
13	3,676	3,631	7,307
14	3,445	3,271	6,716
15	2,358	2,291	4,649
16	1,190	1,163	2,353
17	672	680	1,352
18	403	358	761
19	135	156	291
20	41	52	93
Over 20	..	22	22
Total	41,491	40,319	81,810

An attempt was made to follow up the cases of all the children who had left one public elementary school during the period of one year preceding the study. The work was done by the case method and the homes of the children were visited. The total number of cases studied was 117, of whom 89 were girls. It was found that one-third of these children had graduated and gone on to high school. Another third had gone to work, and of these, 40 per cent had done so without graduating. The children constituting the remaining third were staying at home, and among these a majority had dropped out without graduating.

Of the eighth grade graduates one-half were found

to be illegally employed, as they were less than 16 years of age. Among those who dropped out and went to work before completing the course 80 per cent were illegally employed.

The fact that many girls drop out without graduating and before the end of the legal attendance period and remain at home indicates that most of them do not leave on account of financial necessity. This conclusion is substantiated by the testimony of the girls and their parents, many of whom say that the girls left simply because they grew tired of attending and did not see the value of remaining.

These facts point to the necessity for much more effective work in enforcing the compulsory attendance laws, for far better inspection of shops and factories to detect violations of the child labor laws, and above all to such a reform of the schooling opportunities provided for older girls as will make them and their parents see the value of securing the advantages of the training provided.

Education at the Time of Leaving School

About 3,700 boys and an approximately equal number of girls drop out of the public schools each year. Most of the boys and a considerable number of the girls enter wage-earning at once. Their educational equipment at the time of leaving school is indicated in Table 6.

TABLE 6.—EDUCATIONAL EQUIPMENT OF THE CHILDREN WHO DROP OUT OF THE PUBLIC SCHOOLS EACH YEAR, AS INDICATED BY THE GRADES FROM WHICH THEY LEAVE

Grade	Number leaving
4	70
5	440
6	960
7	1260
8	1630
I	890
II	590
III	150
IV	1410
Total	7400

Slightly less than one-fifth finish the high school course. Nearly three-fifths drop out before entering the high school, and approximately three-eighths before reaching the eighth grade.

Under the present compulsory attendance law a boy who enters school at the age of six and afterwards advances at the rate of one grade per year until the end of the compulsory attendance period should cover nine grades—eight in the elementary school and one in high school—by the time he is 15 years old. In actual fact, however, only about two-fifths get any high school training. Nearly all of the rest take the eight to nine years' attendance required by law to complete eight, seven, six, or even a smaller number of grades.

It is from this body of pupils that most of the wage-

earners are recruited. In the course of the survey several investigations were made for the purpose of finding out what educational preparation workers in various industries had received. One of the most extensive of these was conducted in connection with the study of the printing industry. Educationally the printing trades rank higher than most other factory occupations, yet the average journeyman printer possesses less than a complete elementary education. Composing-room employees, such as compositors, linotypers, stonemen, proof-readers, etc., undoubtedly stand at the head of the skilled trades as to educational training, but it was found that only eight per cent were high school graduates. Six per cent had left school before reaching the seventh grade, and 16 per cent before reaching the eighth grade. The other departments of the printing industry made a much less favorable showing.

An investigation conducted by the Survey in the spring of 1915, covering 5,000 young people at work under 21 years of age, indicated that only about 13 per cent of these young workers had received any high school training and that less than four per cent had completed a high school course. Over one-fifth reported the sixth grade as the last completed before leaving school, and nearly half had dropped out before completing the elementary course. Less than seven per cent of the boys engaged in industrial pursuits had received any high school training and only 42 per cent had got beyond the seventh grade. The educational preparation of the boys en-

gaged in commercial and clerical occupations was somewhat better, nearly 22 per cent having attended high school one year or more; about one-half had left school after completing the eighth grade and nearly one-third had not completed the elementary course.

These facts have a vital relation to the problem of vocational training. If the great majority of the children who will later enter wage-earning occupations do not remain in school beyond the end of the compulsory attendance period, and in addition over half fail to complete even the elementary course, vocational training, to reach them at all, must begin not later than the seventh grade, and if possible, before the pupils reach the age of 14.

CHAPTER V

INDUSTRIAL TRAINING FOR BOYS IN ELEMENTARY SCHOOLS

In Chapter III the distribution of the wage-earners of the city was outlined, mainly for the purpose of establishing a basis on which to make a forecast of the future occupations of the children in the public schools. Such a forecast is essential as the preliminary step in any plan of vocational training to be carried out during the school period, for the reason that without it a clear understanding of the principal factors of the problem is impossible. The kinds of vocational training needed by children in school, and how and where such training should be given, must always depend in the first instance on what they are going to do when they grow up.

The average elementary school in Cleveland enrolls between 350 and 400 boys. When they leave school these boys will scatter into many different kinds of work. With respect to the future vocations of the pupils, the average school represents in a sense a cross section of the occupational activities of the city. It contains a certain number of recruits for each of the principal types of wage-earning pursuits. A few of the boys will later enter professional life;

many will take up some sort of clerical work; a still larger number will be employed in commercial occupations; and the largest group of all will become wage-earners in manufacturing and mechanical pursuits.

The future occupation cannot be foretold accurately with respect to any particular boy, but we do know that, whatever their individual tastes and abilities, the boys must finally engage in activities similar to those in which the adult born native male population is engaged, and in approximately the same proportions. We do not know, for example, whether Johnny Jones will become a doctor or a carpenter, but we do know that of each 1,000 boys in the public schools about seven will become doctors and about 25 will become carpenters, because for many years about those proportions of the boys of native birth in Cleveland have become doctors and carpenters.

One of the most impressive facts which comes to light in the study of occupational statistics is the constancy in these proportions. The business of any community requires certain kinds of work to be performed and the relative amount of work required and consequently the relative number of workers vary but slightly over a long period of time. This principle is illustrated in a striking way by the list of occupations selected at random presented in Table 7, showing the number of persons engaged in the occupations specified among each 100 male workers at two successive census years.

TABLE 7.—PER CENT OF TOTAL MALE WORKING POPULATION ENGAGED IN SPECIFIED OCCUPATIONS, 1900 AND 1910

Occupation	Per cent of total working population	
	1900	1910
Machinists	4.7	5.8
Saloon keepers	1.1	.7
Tailors	2.1	1.7
Commercial travelers	.8	1.1
Lawyers	.5	.4
Barbers	.8	.7
Bakers	.6	.5
Physicians	.6	.5
Carpenters	3.4	3.3
Cabinet makers	.5	.4
Plumbers	.9	.9
Stenographers and typists	.3	.3

With the exception of plumbers and stenographers there was either an increase or a decrease from 1900 to 1910 in the relative number employed in each of these occupations. In only one occupation, however, that of machinist, did the change amount to as much as one per cent. In all the others the shift during the decade was less than one-half of one per cent, and in more than three-fifths of them it did not exceed one-tenth of one per cent of the total number of male workers.

What the Boys in School Will Do

The figures in this table, presented for illustrative purposes, do not accurately represent the proportions of boys now attending the public schools who are likely to enter the occupations named, because

they do not take into account the fact that a considerable number of the workers in Cleveland came to this country after they reached adult manhood and that a disproportionate number of these foreign born workers enter the industrial occupations. For this reason the total adult working population is not strictly comparable with the school enrollment, which is approximately nine-tenths native born. When the boys in the public schools grow up they will be distributed among the different trades, professions, and industries in about the same proportions as are the American born men in the city at the present time. This distribution is shown for the different occupational groups in Table 8.

TABLE 8.—DISTRIBUTION OF NATIVE BORN MEN BETWEEN THE AGES OF 21 AND 45 IN THE PRINCIPAL OCCUPATIONAL GROUPS

Occupational group	Approximate per cent
Manufacturing and mechanical occupations	44
Commercial occupations	20
Clerical occupations	16
Transportation occupations	11
Domestic and personal service occupations	5
Professional occupations	3
Public service occupations	1
Total	100

The figures in the column at the right of the table represent the number of native born men between the ages of 21 and 45 among each hundred native born male inhabitants engaged in the occupations comprehended in the various groups. In the case of the industrial group the figure is too high, as the

census data relative to the distribution of foreign and native born include all ages, and there is a smaller proportion of American born adult men employed in industry than is found in the lower age groups. Extensive computations have shown, however, that the inaccuracies due to this cause are not serious enough to affect the use of the figures for our purpose.

Let us now consider what these proportions mean in establishing vocational courses to prepare boys for wage-earning pursuits. The future expectations of the boys in a large elementary school enrolling say 1,000 pupils of both sexes would be about as follows:

Number of boys who will enter

Manufacturing and mechanical occupations	220
Commercial occupations	100
Clerical occupations	80
Transportation occupations	55
Domestic and personal service occupations	25
Professional occupations	15
Public service occupations	5
Total	500

This distribution includes all pupils, from the beginners in the first grade to the older boys in the seventh and eighth grades. It is certain, however, that differentiated instruction for vocational purposes is not possible or advisable for the younger children. According to the commonly accepted view among educators, vocational training should not be undertaken before the age of 12 years, and many believe that this is too early. In an elementary school of 1,000 pupils there would be about 80 boys 12 years

old and over. Applying to this number the ratios given in the previous table we obtain the following:

Number of boys who will enter	
Manufacturing and mechanical occupations	35
Commercial occupations	16
Clerical occupations	13
Transportation occupations	9
Domestic and personal service occupations	4
Professional occupations	2
Public service occupations	1
Total	80

The industrial group includes all of the skilled trades and most of the semi-skilled and unskilled manual occupations. The skilled trades are usually grouped in four main classifications: metal trades, building trades, printing trades, and "other" trades, these last comprising a number of small trades in each of which relatively few men are employed. With respect to their future occupations the 35 boys in the industrial group are likely to be distributed about as follows:

Number of boys who will enter	
Metal trades	8
Building trades	7
Printing trades	1
Other trades	2
Semi-skilled and unskilled industrial occupations	17
	35

The analysis can be carried still further, for these trade groups are by no means homogeneous. The building trades, for example, include over 20 distinct trades, a number of which have little in com-

mon with the others as to methods of work and technical content.

Organization and Costs

At this point it becomes necessary to take cognizance of certain administrative factors which have a marked bearing on the problem. They relate to the organization of classes in elementary schools and the cost of teaching. In a school of 1,000 pupils there would be at least five separate classes for the seventh and eighth grades. The 35 boys who need industrial training are not all found in a single class, but are distributed more or less evenly throughout the five classrooms, that is, there are approximately seven in each class. A differentiated course under these conditions is difficult if not impossible. In a few of the Cleveland elementary schools the departmental system of teaching is in use. Under this plan something might be done, were it not that the total number of pupils requiring instruction relating specifically to the industrial trades is too small to justify the expense necessary for equipment, material, and special instruction required for such training. This is true as regards even an industrial course of the most general kind, while provision for particular trades is entirely out of the question. The machinist's trade employs more men than any other occupation in the city, yet the number of seventh and eighth grade boys in the average elementary school who will probably become machinists does not exceed five or six.

Not over two boys are likely to enter employment in the printing industry. The smaller trades, such as pattern making, cabinet making, molding, and blacksmithing are represented by not more than one boy each.

A possible alternative is the plan now followed in the teaching of manual training whereby the boys of the upper grades in various elementary schools are sent to one centrally located for a short period of instruction each week. The principal objection to this plan is that the amount of time now given is insufficient to accomplish much in an industrial course, nor can it be materially increased without seriously interfering with the work in other subjects.

The first condition for successful industrial training is the concentration of a large number of pupils old enough to benefit by such training in a single school plant. Only in this way is it possible to bring the cost of teaching, equipment, and material within reasonable limits and provide facilities for differentiating the work on the basis of the vocational needs of the pupils. The fact that this condition cannot be met in elementary schools is one of the strongest arguments in favor of conducting the seventh and eighth grade work under the junior high school form of organization.

What the Elementary Schools Can Do

The most important contribution to vocational education the elementary school can make consists in

getting the children through the lower grades fast enough so that they will reach the junior high school by the time they are 13 years old, in order that before the end of the compulsory attendance period they may spend at least two years in a school where some kind of industrial training is possible. That this is not being done at the present time the data presented in Chapter IV amply demonstrate. In recent years there has been a tendency to regard vocational training as a remedy for retardation. The fact is that the cure of retardation is not a subsequent but a preliminary condition to successful training for wage-earning. Vocational training is not a means for the prevention of retardation, but retardation is a most effective means for the prevention of vocational training.

CHAPTER VI

THE JUNIOR HIGH SCHOOL

In 1915 the Board of Education authorized the establishment of a system of junior high schools in the city, and at the beginning of the school year of 1915–16 the new plan was inaugurated in two schools. The Empire Junior High School, situated in the eastern part of the city, had an enrollment of about 700 children made up of seventh and eighth grade pupils formerly accommodated in the elementary schools of that section. The Detroit Junior High School on the west side had an enrollment of about 400 pupils. No decision has yet been reached as to whether the course shall include only two years' work, or three years, as in other cities of the country where the junior high school plan has been adopted.

A comparison of the course with that for corresponding grades of the elementary schools shows some marked differences. Less time is devoted to English in the junior high school and considerably more to arithmetic, geography, and history. Mechanical drawing, not taught in the elementary schools except incidentally in the manual training classes, is given an hour each week. All boys receive one hour of manual training a week against slightly

less than one and one-half hours in the seventh and eighth elementary grades, but they may elect an additional two and one-half hours a week in this subject, together with applied arithmetic during the first year, or with bookkeeping during the second. Girls may elect an additional two and one-half hours a week of domestic science, with bookkeeping. The manual training for boys comprises woodwork and bookbinding.

Specialized Training not Practicable

In the junior high school, as in the elementary school, the greatest difficulty in the way of trade training for specific occupations lies in the small number of pupils who can be expected, within the bounds of reasonable probability, to enter a single trade. Hand and machine composition, the largest of the printing trades, will serve as an example. In a junior high school of 1,000 pupils, boys and girls, the number of boys who are likely to become compositors is about five. But to teach this trade printing equipment occupying considerable space is necessary, together with a teacher who has had some experience or training as a printer. The expense per pupil for equipment, for the space it occupies, and for instruction renders special training for such small classes impracticable. All of the skilled occupations, with the exception perhaps of the machinist's trade, are in the same case. An attempt to form separate classes for each of the eight largest trades in the city would

result in two classes of not over five pupils, three classes of not over 10 pupils, and only one of over 13 pupils. The following table shows the number of boys, in a school of this size, who are likely to enter each of these trades.

Number of boys who will probably become:

Machinists	36
Carpenters	13
Steam engineers	11
Painters	10
Electricians	9
Plumbers	7
Compositors	5
Molders	5

A General Industrial Course

The members of the Survey Staff were, however, of the opinion that through the system of electives in the junior high school, industrial training of a more general type, made up chiefly of instruction in the applications of mathematics, drawing, physics, and chemistry to the commoner industrial processes, would be of considerable benefit to those boys who, on the basis of their own selection or that of their parents, are likely to enter industrial pursuits. A course of this kind is outlined in following sections of this chapter.

The objections which may be brought against this plan are frankly recognized. It takes into account only the interests of the industrial group, comprising less than one-half of the boys in the school. Unquestionably it would tend to vitalize the teaching of

mathematics, drawing, and science for the boys who enroll in the industrial course, but it leaves unsolved the question of method and content of instruction in these subjects for the boys in the non-industrial or so-called academic course. Very possibly future experience may demonstrate that the plan recommended for the general industrial course affords the best medium for teaching science and mathematics at this period to all pupils, in which case a differentiated course would be unnecessary.

The organization of vocational training in junior high school grades presents many difficulties which cannot be solved by a more or less abstract study of educational and industrial needs. Experimentation on an extensive scale, covering a considerable period of time, is necessary before definite conclusions can be drawn as to the limitations and possibilities of such work. It is with a full appreciation of this fact that the following suggestive outline is presented.

The purpose of the general industrial course is to afford to boys who wish to enter industrial occupations the opportunity to secure knowledge and training that will be of direct or indirect value to them in industrial employment. It is not expected that by this means they can be given much practical training in hand work for any particular trade. The most the school can do for the boy at this period is to bridge over for him the gap that exists between the knowledge he obtains from books and the rôle which this knowledge plays in the working world. It must not be assumed that the transition can be effected

merely by the introduction of shop work, even if it were possible to provide the wide variety of manual training necessary to make up a fair representation of the principal occupations into which the boys will enter when they leave school. It is doubtful whether, so far as its vocational value is concerned, shop work isolated from other subjects of the curriculum is worth any more per unit of time devoted to it than several of the so-called academic subjects. This is particularly true of the two most common types of manual training—cabinet making and forge work. Both represent dying trades. During the decade 1900–1910 the increase in the number of cabinet makers in Cleveland fell far below the general increase in population. The blacksmiths made a still poorer showing. Both trades are recruited mainly from abroad and the relative number of Americans employed in them is steadily declining.

In the opinion of the Survey Staff a general industrial course should cover instruction in at least the following five subjects: Industrial mathematics, mechanical drawing, industrial science, shop work, and the study of economic and working conditions in wage earning pursuits. These may be offered as independent electives or they may be required of all pupils who elect the industrial course. The details of organization must, of course, be worked out by trial and experiment. They will probably vary in different schools and from year to year.

Of the hundreds of employers who were interviewed by members of the Survey Staff as to the technical equipment needed by beginners in the various trades, nearly all emphasized the ability to apply the principles of simple arithmetic quickly, correctly, and accurately to industrial problems. Many employers criticized the present methods of teaching this subject in the public schools. In the main their criticisms were to the effect that the teaching was not "practical." "The boys I get may know arithmetic," said one, "but they haven't any mathematical sense." Another cited his experience with an apprentice who was told to cut a bar eight and one-half feet long into five pieces of equal length. He was not told the length of the bar, but was given the direct order: "Cut that bar into five pieces all of the same size." The boy was unable to lay out the work, although when asked by the foreman, "Don't you know how to divide 8½ by 5?", he performed the arithmetical operation without difficulty. The employer gave this instance as an illustration of what to his mind constituted one of the principal defects of public school teaching. "Mere knowledge of mathematical principles and the ability to solve abstract problems is not enough," he said. "What the boys get in the schools is mathematical skill, but what they need in their work is mathematical intelligence. The first does not necessarily imply the second."

This mathematical intelligence can be developed

only through practice in the solution of practical problems, that is, problems which are stated in the every day terms of the working world and which require the student to go through the successive mental steps in the same way that he would if he were working in a shop. The problem referred to above is one of division of fractions. If we state it thus: "$8\frac{1}{2} \div 5$," the pupil takes pencil and paper, performs the operation and announces the result. If we say, "A bar $8\frac{1}{2}$ feet long is to be cut into five pieces of equal length; how long should each piece be?", the problem calls for the exercise of greater intelligence, as the pupil must determine which process to use in order to obtain the correct result. It becomes still more difficult if we merely show him the bar and say: "This bar must be cut into five pieces of equal length; how long will each piece be?" Several additional preliminary steps are required, none of which was involved in the problem in its original form. Before the length of the pieces can be computed he must find out the length of the bar. He must know what to measure it with, and in what terms, whether feet or inches, the problem should be stated. Again, if we say: "Lay this bar out to be cut in five equal lengths," another step—the measurement and marking for each cut—is added. Many variations might be introduced, each involving additional opportunities for the exercise of thought.

It is through practice in solving problems of this kind that the pupil acquires what the employer called mathematical intelligence. It consists in the ability

to note what elements are involved in the problems and to decide which process of arithmetic should be used in dealing with them. Once these decisions are made the succeeding arithmetical calculations are simple and easy. In technical terms the ability that is needed is the ability to generalize one's experiences. In every-day terms it is the ability to use what one knows.

The work in applied mathematics should cover a wide range of problems worded in the language of the trades and constantly varied in order to establish as many points of contact as possible between the pupil's knowledge of mathematics and the use of mathematics in industrial life. Practical shop work is one of the best means to this end. The trouble with much of the shop work given in the schools is that it runs to hand craftmanship in which the object is to "make something" by methods long ago discarded in the industrial world, rather than to give the pupil exercise in the sort of thinking he will need to do after he goes to work. Successful teaching does not depend so much on the use of tools and materials as on the teacher's knowledge of the conditions surrounding industrial work and his ability to originate methods for vitalizing the instruction in its relation to industrial needs.

Mechanical Drawing

At the present time the junior high school course provides for one hour a week of mechanical drawing.

All the boys who may be expected to elect the industrial course can well afford to devote more time to drawing. For such boys no other subject in the curriculum, except perhaps applied mathematics, is of greater importance. In many of the trades the ability to work from drawings is indispensable and the man who does not possess it is not likely to rise above purely routine work.

In a drawing course for future industrial workers the emphasis should be placed on giving the pupil an understanding of the uses of drawing for industrial purposes, rather than on fine workmanship in making drawings. Seventh grade boys can't be made into draftsmen in three years and if they leave school at 15 they are not likely to become draftsmen. The ordinary skilled workman seldom has any need to make drawings or designs, beyond an occasional rough sketch, but he often has to work from drawings. To put it in another way, drawing to the average workman is like an additional language of which he needs a reading but not a writing knowledge. No doubt it would be well to teach him to write and read with equal skill, but in the two or three years most of these boys will remain in school there is not time enough to do both.

Industrial Science

In many of the trades an introductory knowledge of physics and chemistry is of considerable advantage. Boys in the junior high school cannot be expected

to take formal courses in these subjects, but they should not leave school without some acquaintance with them and a knowledge of their relations to industrial processes. A fair equipment should be provided for demonstrational and illustrative purposes. The subject matter should be correlated as closely as possible with the shop work, and the principal mechanical and chemical laws explained as the shop problems furnish examples of their application.

In addition the boys should be taught the common technical terms used in trade hand books. The man who expects to advance in his trade will have to keep on learning after he leaves school. There are many avenues of information open to him, and the school can perform no more valuable service than to point the way to the sources of knowledge represented by reference books, trade journals, and other technical literature. Some of the popular magazines, such as "The Scientific American," "The Illustrated World," and "Popular Mechanics" can be used most effectively to bring home to the pupils the close connection existing between the class work and the outside world of science and invention.

Shop Work

It is difficult to determine the exact function of the manual training shop work in cabinet making and bookbinding which figures in the curriculum at present. That the work was not planned with vocational training in mind seems clear from the action

of the school board in adding bookbinding to the course about the middle of the year. The bookbinding trade is one of the smallest in the city, and there is little probability that more than one boy among the total number enrolled in both junior high schools will enter it after leaving school.

Fully three-fourths of the industrial group will later be employed in occupations where most of the work is done with machines or machine tools. Even in the hand tool trades, such as carpentry, sheet metal work, cabinet making, and blacksmithing, the use of machines is constantly increasing. It would seem, therefore, that some acquaintance with different types of machines would be of considerable value to the pupils who may later enter industrial employment. The number of boys who are likely to become machinists is large enough to warrant the installation of a small machine shop. Repairing, assembling, and taking apart machines should occupy an important place in the shop course. Most boys are intensely interested in getting at the "insides" of a machine, and the processes of assembling, with their attendant problems of adjustment and coordination of mechanical movements, afford opportunities for the best kind of practical instruction. One of the great advantages of this type of shop work lies in the fact that it consumes little or no material and is therefore inexpensive; another is that a fairly extensive equipment can be easily obtained, as any machine, old or new, will serve the purpose and may be used over and over again.

The extent and variety of shop equipment will depend largely on the resources of the school system. The more the better, so long as the money is expended on the principle of the greatest good to the greatest number, which means that the kinds of tools and equipment used in the large trades should be preferred to those used only in the smaller trades.

In order that the time devoted to shop work may yield its greatest results, it is necessary that every lesson center around knowledge and ability that will be of real subsequent use to the pupils. It must not run to "art" and it must not be mere tinkering. Its principal value as vocational training, in the last analysis, lies in its use as an objective medium for the teaching of industrial mathematics and science.

Vocational Information

During the second and third years all the boys who elect the industrial course or who expect to leave school at the end of the compulsory attendance period should be required to devote some time each week to the study of economic and working conditions in wage earning industrial and commercial occupations. A clear understanding of the comparative advantages of different kinds of employment is of the highest importance at this period of the boy's life. It seems to be generally assumed that an adequate basis of knowledge for the selection of an industrial vocation is an acquaintance with materials and processes. Such knowledge is valuable, but

making a living is mainly an economic problem. What an occupation means in terms of income is more significant than what it means in terms of materials. The most important facts about the cabinet making trade, for example, are that it offers very few opportunities for employment to public school boys, and that it is one of the lowest paid skilled trades. The primary considerations in the intelligent selection of a vocation relate to wages, steadiness of employment, health risks, opportunities for advancement, apprenticeship conditions, union regulations, and the number of chances there are for getting into it. These things are fundamental, and any one of them may well take precedence over the matter of whether the tastes of the future wage-earner run to wood, brick, stone, or steel.

CHAPTER VII

TRADE TRAINING DURING THE LAST YEARS IN SCHOOL

Between the end of the compulsory attendance period and the entering age in most of the trades there exists a gap of from one to two years which is not adequately covered by any of the present educational agencies of the school system.

Two years ago the Ohio State legislature extended the compulsory attendance period from 14 to 15 for boys and from 14 to 16 for girls. The result has been to force into the first years of the high school course a considerable number of pupils who have no intention of taking the complete four year course, and who will leave as soon as they reach the end of the compulsory period. That these pupils are probably not getting all that they might out of the time they attend high school is no argument against the present compulsory attendance age limit, which should be raised rather than lowered.

The study of industrial conditions conducted during the survey left every member of the Survey Staff firmly convinced that the industries of Cleveland have little or nothing worth while to offer to boys

under 16. Very few of the skilled trades will accept an apprentice below this age. The general opinion among manufacturers was unfavorable to the employment of boys under 16. "They are more of a nuisance than a help," said one; "they are not old enough to understand the responsibilities of work." "They break more machinery and spoil more material than they are worth," said another. In several of the building trades apprentices must be 17 years old, as the law forbids boys under this age to work on scaffoldings. The new workmen's compensation law exerts a strong influence in favor of a higher working age limit, owing to the greater risk of accident among young workers.

The fact is that the law is still about one year behind the requirements of industrial life. If a vote were taken among employers who can offer boys the opportunity to learn a trade it would be found that a large majority favor raising the working age to 16. Employment before this time usually leads nowhere, and the pittance the boy earns cannot be compared with the economic advantage he could derive from an additional year in a good vocational school. The average boy who leaves school at 15 spends a year or two loafing or working at odd jobs before he can obtain employment that offers any promise of future advancement. These years are often more than wasted, as he not only learns nothing of value from such casual jobs, but misses the healthy discipline of steady, orderly work, which is of so great importance during these formative years of his life.

The Technical High Schools

The two technical high schools, the East Technical and West Technical, occupy an important place among the secondary schools of the city. At the present time the two schools enroll nearly two-fifths of the boys attending high school. The course comprises four years' work. In the East Technical the shopwork includes joinery and wood-turning during the first year, and pattern making and foundry work during the second year. In the West Technical the first year course includes pattern making and either forging or sheet metal work; and that of the second year, forging, pipe-fitting, brazing, riveting, and cabinet making. During the remaining two years of the course the student may elect a particular trade, devoting about 10 hours a week to practice in the shop during the last half of the third year, and from 11 to 15 hours during the fourth year.

The proportion of pupils who graduate is small and the mortality during the first two years is very heavy. This is due in part to the fact that the type of pupil who leaves school early is more likely to elect a technical course than an academic course. About 25 per cent of each entering class drops out after attending one year, and 25 per cent of the remainder by the end of the second year. By the time the third year is reached the classes are greatly depleted and the survivors as a rule are of the more intelligent and prosperous type. Only a small proportion of them expect to enter skilled manual occupations. Table 9 shows the distribution of the third and fourth year

students among the different trade courses during the first semester of 1915–16.

TABLE 9.—DISTRIBUTION OF THIRD AND FOURTH YEAR STUDENTS IN TRADE COURSES IN THE CLEVELAND TECHNICAL HIGH SCHOOLS, FIRST SEMESTER, 1915–16

Trade courses	Students
Electrical construction	68
Machine work	52
Printing	28
Cabinet making	22
Pattern making	12
Foundry work	1
Total	183

That relatively few of these students will ultimately become journeymen workmen is shown by the records of the boys graduated in the past. The principal of the East Technical High School recently sent a questionnaire to all the students graduated up to 1915, asking for information as to their present occupations and their earnings during the first four years after graduation. Of those who replied, over 60 per cent either were attending college, or employed as draftsmen or chemists. About 28 per cent were employed in the skilled trades. The distribution in detail is shown in Table 10.

The data furnished by graduates as to their earnings during successive years after leaving school supply still more convincing evidence to the effect that the technical school graduate seldom remains in manual work more than two or three years. The complete course gives them an equipment of practical and theoretical knowledge that speedily takes them out

of the handwork class. The technical high schools are primarily training schools for future civil, electrical, and mechanical engineers. To the student who cannot afford a college course they offer excellent preparation for rapid advancement to supervisory and executive industrial positions, and for drafting and office work in manufacturing plants.

TABLE 10.—DISTRIBUTION BY OCCUPATION OF CLEVELAND TECHNICAL HIGH SCHOOL GRADUATES

Occupation	Number
Attending college	111
Draftsmen	51
Electricians	33
Machinists	32
Chemists	8
Pattern makers	7
Cabinet makers	6
Printers	3
Foundrymen	1
Unclassified	32
Total	284

The output of the schools falls into two main divisions: those who leave at the end of the second year or earlier, and those who graduate. The records show that most of the pupils who reach the third year complete the course, but nearly half drop out during the first and second years. The benefit they obtain from these two years' attendance is problematical. The course was designed on the basis of four years' attendance, and the work of the first two years is to a considerable degree a preparation for that of the last two.

The principals of both schools are fully alive to the disadvantages of the course for the large number of pupils who drop out within a year or two, and admit that such students would derive greater benefit from more practical instruction aimed directly toward preparation for the industrial trades. Both believe that the only practicable solution is a two-year trade course in a separate school, covering a much wider range of shop activities than the present high school course.

To the only alternative—the institution of a short course within the technical schools to be conducted either as a part of or simultaneously with the four year course—they present objections of considerable weight. They point out that a preparatory course for the trades and a preparatory course with college as the goal differ not only in length but in kind. The work in mathematics for the future civil engineer, for example, must conform to college entrance standards and involves an amount of study that is quite unnecessary for the boy whose aim is to become a carpenter or machinist. The first needs a thorough course in algebra, geometry, and trigonometry; the second needs industrial arithmetic, with only such applications of higher mathematics as may be of use to him in his trade. The same principle holds with respect to other subjects.

What boys who expect to enter industrial occupations most need at this period is instruction that will be of practical value to them for future wage earning. It is doubtful whether high school courses which

have been formulated in the first instance to prepare pupils for a college course can furnish such instruction and it is still more doubtful whether the trade training required by the future mechanic and the broader preparation required for the professions can be given effectively in the same school.

A Two-Year Trade Course

It is the opinion of the Survey Staff that a separate school in which direct training for the industrial trades is emphasized would result in more profitable use of the pupils' time and probably induce many of them to remain in school up to the apprentice entering age. Such a school, with a curriculum embracing vocational training for all the principal trades, would easily command an enrollment sufficient to justify the installation of a good shop equipment and the employment of a corps of teachers qualified by special training and experience for this kind of work. Even if only one-half the number who enter the skilled trades each year attended the school, the enrollment would reach at least 800 boys.

A trade school of this kind would relieve the first and second year classes of many pupils that the technical high schools do not want and cannot adequately provide for. The minimum entering age should be not less than 14, and no requirement other than age should be imposed. This would draw part of the over-age pupils from the grades and take from the junior high school a certain number of boys who

could profit by the greater amount of time given to shop work in the trade school.

A good many will stay only one year, and every effort should be made at the time of entrance to learn the intentions of the pupil. If it seems fairly certain that he will not remain longer than a year he may well omit such studies as have no direct bearing on the trade he wishes to learn. The courses should follow the lines laid down in the general industrial course recommended for the junior high school, but with a greater proportion of the time devoted to practical shopwork. As the number of pupils for each trade class would be relatively large, a closer correlation could be effected between the academic subjects and the work in the shops than is possible in the junior high school.

Both general and special courses should be provided. Many of the pupils will wish to specialize on a particular trade. Others who have not yet reached a decision need a general course that will give them a wide range of experience with materials and processes. The organization of classes should be planned so as to permit transfers, whenever desirable, from the general to the special courses, or vice-versa.

By the time the pupil has reached the second year he usually will settle down to steady work on the trade he selects, although here again the organization should be sufficiently elastic to allow transfers when there seems to be good reason for making them. It is to be expected, however, that nearly all the pupils will devote their time during the second year

to practice and study limited to single trades. The success of the school in holding boys to the age of 16 or 17 will depend on its ability to convince them that the extra time in school is a paying investment, and this cannot be done unless they stick to one line of work.

CHAPTER VIII

TRADE-PREPARATORY AND TRADE-EXTENSION TRAINING FOR BOYS AND MEN AT WORK

Several forms of trade-preparatory and trade-extension training for apprentices and journeymen workmen are carried on in the city. Probably the most effective work done in the teaching of boys after they have entered employment is found in manufacturing establishments which maintain apprentice schools in connection with their shops. There are two excellent examples of this type of instruction in Cleveland—the apprentice schools conducted by the New York Central Railroad and by the Warner and Swasey Company, manufacturers of astronomical instruments and machine tools.

The Warner and Swasey Company school was established in 1911. The course covers a total of 560 hours, extending over a period of four years. The apprentices attend the school four hours a week for 35 weeks each year. The time allotment for the various subjects included in the course is shown in Table 11.

In 1915 there were 65 apprentices enrolled in the school, most of them from the machinist's trade.

The sessions are held during working hours in a room in the factory fitted up with drawing tables and blackboards. No shop equipment is used. The purpose of the course is to develop a body of trained workmen competent to take positions in the factory as foremen or heads of departments. Less than one-tenth of the total time of the course is devoted to the study of shop practice. Standard textbooks are used in the teaching of mathematics.

TABLE 11.—TIME ALLOTMENT IN THE APPRENTICE COURSE GIVEN BY THE WARNER AND SWASEY COMPANY, CLEVELAND

Subject	Hours
Arithmetic	35
English	65
Mechanical drawing	70
Shop practice	40
Algebra	70
Geometry	40
Trigonometry	30
Physics	70
Materials	35
Industrial history	35
Mechanics, strength of materials, and mechanical design	70
Total	560

The enrollment in the school conducted by the New York Central Railroad is about 140 boys, nearly all of whom are machinists' apprentices. They are divided into three classes, the members of each class attending the school four hours a week. About two-thirds of the time is devoted to mechanical drawing and one-third to mathematics and shop practice. The instruction in these two latter subjects is based on a series of graded mimeographed or blue print

lesson sheets, containing a wide variety of shop problems, with a condensed and simplified explanation of the mathematical principles involved. In the main the work is limited to the application of simple arithmetic to problems of shop practice. No textbooks are used, but the booklets on machine shop practice published by the International Correspondence Schools are studied in connection with the course.

In addition to the required classroom work in mechanical drawing, each apprentice serves four or five months of his term in the regular drafting rooms of the company. The classroom is equipped with models of railway appliances and machinery, together with laboratory apparatus for teaching the laws of mechanics. No machine tools or other shop equipment are used in the classes. The course covers about 700 hours of instruction exclusive of the time spent in regular drafting room work. About 20 apprentices finished the course in 1915.

Several of the building and printing trades' labor unions take an active interest in the training of apprentices, and in at least two instances the unions maintain evening classes for teaching trade theory. The Electrical Workers' Union, made up principally of inside wiremen, conducts apprentice classes taught by journeymen. The International Typographical Union course for compositors and compositors' apprentices is undoubtedly the best yet devised for giving supplementary training in hand composition. It is taught by journeymen in evening classes, under the supervision of the central office of the Typo-

graphical Union Commission, to which all the work must be submitted. In February, 1916, about 100 students were enrolled, of whom approximately one-third were apprentices and two-thirds journeymen. The course consists of 46 lessons in English, lettering, design, color harmony, job composition, and imposition for machine and hand folding. The classes are held at the headquarters of the union. As the students' daily practice in the shop provides plenty of opportunity for the acquisition of manual skill, no apparatus or shop equipment is used in connection with the course.

The apprentice school conducted by the Y. M. C. A. represents another type of apprentice training. The instruction is given during the day. The apprentices are sent to the school by various firms in the city under an arrangement whereby the boys attend four and one-half hours each week during regular shop time. In February, 1916, the enrollment consisted of 46 apprentices, practically all from the metal trades. The employers pay the tuition fee, which amounts to $20 a year. The course requires four years' work of 40 weeks each, a total of 720 hours. It comprises instruction in shop mathematics, drawing, English, physics, and industrial hygiene. No shop equipment is used. Fifteen boys were graduated from the course this year.

The factory apprentice school of the Warner and Swasey Company and New York Central Railroad type possesses many advantages over any kind of continuation instruction carried on outside of the

plants where the boys are employed. A better correlation between the class and shop work is possible together with a more personal relation between teacher and pupils than is usually found when the pupils are drawn from a number of different establishments. It must be admitted, however, that this method of training apprentices is not feasible except in very large plants, as in small classes the teaching cost becomes prohibitive. There is little probability that it will ever be adopted by enough employers to take care of more than an insignificant proportion of the boys who enter the skilled trades.

The results obtained, here and in other cities, through coöperative schemes, such as the Y. M. C. A. continuation school, are in the main disappointing. Their failure to reach more than a few of the boys who need trade-extension training is due partly to the fact that they operate under a condition that is fundamentally unjust. One employer interviewed during the survey stated the case very clearly: "I can see no good reason why I should make pecuniary sacrifices for the benefit of my competitors. Very few of my apprentices remain until the end of their term, because by the time they have completed their second year other firms which make no effort to train their quota of skilled workmen for the trade steal them away from me. Any plan for the training of apprentices which does not apportion the burden among the different establishments in direct proportion to the number of men they have, simply

penalizes those public-spirited employers who participate in it."

Continuation Training from 15 to 18

The years between 15 and 18 are among the most important in the life of the young worker. If left to his own devices during this period, he is very likely to lose much of vocational value of his earlier education, because he does not grasp the relation which the knowledge he acquired in school bears to his daily work. As a result the problem of supplementary instruction at a later age, when he wakes up to his need for it, becomes much more difficult than if trade-extension training had been taken up at once when he entered employment.

The vocational interests of young workers and the social interests of the community are both opposed to the current practice of "graduating" boys from the public schools at the ages of 15 or 16 and then losing sight of them. The fact that the large number who go into industrial occupations will not or cannot remain in school beyond these ages does not absolve the school system from further responsibility for their educational future. There should not be a complete severance between the boy and the school until he has reached a relatively mature age. In other words, the school system should maintain, as long as possible, such a relation with him as will help to round out his education and lead him to continue it after reaching manhood.

It is the opinion of the Survey Staff that the only practicable solution of this problem lies in the day continuation school, backed by a compulsory law which will bring every boy and girl at work under the age of 18 into school for a certain number of hours per week. Only through a comprehensive plan that will reach large numbers of young workers can the difficulties inherent in the administration of small classes be overcome. The night schools have never been successful in holding boys long enough to make more than a beginning in trade-extension training. It is certain that growing boys should not be expected to add two hours of study to their nine or 10 hours of unaccustomed labor in the shop. Both individual and community interests demand that this problem be taken up in such a way as to obviate the sharp cleavage between the boy's school life and his working life. From every point of view it is unwise to permit him to lose all contact with the educational agencies of the city during his first years at work.

The compulsory continuation school avoids the difficulties which are responsible for the common failure of those schemes which depend for their success on the initiative of individuals or the voluntary coöperation of employers and trade unions. One of its great advantages is that the principle on which it is based makes for equal justice to all. There can be no doubt that the decline of apprentice training in the shops is due partly to the fact that employers find that much of the time and money it costs goes toward providing a skilled labor force for competitors

who make no effort to train young workers. The cooperation of employers on a comprehensive scale will be secured only when the burden is equally shared.

The Technical Night Schools

Night classes are conducted in both of the technical high schools for two terms a year of 10 weeks each, the pupils attending four hours a week. A tuition fee of $5 a term is collected, of which $3.50 is refunded to those who maintain an average attendance of 75 per cent. No special provision is made for apprentices as distinct from journeymen, and the trade classes are attended by a considerable number of wage-earners employed in occupations unrelated to industrial work. The list of courses offered during the past year, with the number enrolled in each course at the beginning of the secoud term, is shown in Table 12.

A glance at the list of courses shows at once that while the vocational motive is given first importance, the schools also aim to provide instruction in cultural subjects which have only an indirect vocational application. Less than one-third of the students are pursuing courses which are directly related to their daily work. The remainder are enrolled in courses which have little or no connection with their daily occupations. In but four of the courses—machine shop, architectural drawing, printing, and sheet metal work—are more than half of the students employed in directly related occupations.

TABLE 12.—COURSES AND NUMBER ENROLLED IN THE TECHNICAL NIGHT SCHOOLS, JANUARY, 1915

Course	Number enrolled
Mechanical drawing	328
Machine shop	222
Electrical construction	159
Sewing	103
Mathematics	89
Architectural drawing	83
Pattern making	73
Woodworking	67
Chemistry	59
Sheet metal drawing	52
Cooking	46
Foundry work	36
Agriculture	31
Printing	27
Sheet metal shop	23
Business English	20
Electric motors	19
Arts and crafts	18
Millinery	18
Electricity and magnetism	16
Total	1,489

The policy of the schools is to form a class in any subject for which a sufficient number of students make application. Only a small proportion of the pupils attend more than one year, and the mortality from term to term is very high, although the tuition fee plan insures fairly good attendance during the term. The data collected by the survey indicate that the average length of attendance is approximately two terms—the equivalent in student hours of less than three weeks in the ordinary day school.

Most of the men who enroll in night school classes need a course of at least two or three years. All but a few, however, insist on having their supplementary

training in small doses. Frequently they want only specific instruction about a specific thing, such as how to lay out a certain piece of work or how to set up a particular machine tool. They want to secure this knowledge in the shortest possible time, and very few want the same thing. A course of two or three years does not appeal to them. Another difficulty is that their previous educational equipment varies widely, and some are not capable of assimilating even the specialized bit of trade knowledge they need without a preliminary course in arithmetic. As the personnel of the classes changes to a marked degree from term to term, the courses undergo frequent modifications. Apparently the teachers and principals have made a sincere effort to adapt the instruction to the demands of the men who attend the schools, but the fact is that the difficulties inherent in such work make it impossible to organize the classes on any basis except that of subject matter, which means fitting students into courses, rather than adapting courses to the needs of particular groups of workers.

The enrollment is far below what should be expected in a city of nearly three-quarters of a million inhabitants. The total number of journeymen, apprentices, and helpers from the skilled manual occupations, receiving trade instruction in the night schools, is considerably less than one per cent of the total number in the city.

A large enrollment is necessary for efficient administration. Success in specializing courses in night

schools, as in day schools, requires a large administrative unit. The possible variety of courses is in direct ratio to the number enrolled. In a class of 200 carpenters there would probably be, for example, 10 or 15 men who need specialized instruction in stair-building. On the basis of the present enrollment of 40 or 50 carpenters the class would dwindle to three or four, with the result that the per capita teaching cost becomes prohibitive.

The relatively small result now obtained is not the fault of the schools, but is due principally to the fact that the great field of evening vocational instruction is treated by the school system as a mere side line of the technical high schools. The evening classes are taught by teachers who have already given their best in the day classes. The enrollment cannot be greatly increased so long as this type of education is handled as one of the marginal activities of the school system, manned by tired teachers and directed by tired principals. It is a totally different kind of job from regular day instruction and requires a different administrative organization, with a responsible head vested with sufficient authority to meet quickly and effectively the widely varying demands of its students. This will require the speeding-up of administrative methods in the establishment of courses and the employment of teachers, a freer hand for the principals as regards both expenditures and policy, and most important of all, the organization of all forms of continuation and night school instruction under a separate department.

A Combined Program of Continuation and Trade-Extension Training

In considering the general conclusions of the survey as to what should be done in the matter of trade preparatory and trade-extension training in both day and night schools, it must be borne in mind that these two types of vocational training are still in the experimental stage. Their future development will probably involve a wide departure from conventional school methods and the evolution of a special technique through trial and experiment. At the present time we can only formulate certain of the main conditions to which future advance in these fields must conform.

First of all, it must be recognized that such work is a big job in itself and cannot be successfully conducted as an appendix of the day school. It is worth doing well, or it is not worth doing. It needs an organization sufficiently elastic and adaptable to quickly make adjustments to unusual and unexpected conditions. It needs the supervision of a competent director who can devote to it all his time and energy, and a corps of teachers who not only know how and what to teach, but who possess a firm conviction of the value and utility of this kind of instruction. In the hands of teachers who bring to it only the margin of interest and energy remaining after a hard day's work in the high school, or who are unable to comprehend the radical difference between teaching a boy in the day school 35 hours a week and teaching a boy four hours a week in the

continuation school or evening class, the full measure of success cannot be expected. The employment of day teachers for night school work has never been other than a makeshift, and the insignificant results attained in night schools throughout the country have been due in great measure to this cause.

Apart from the fact that the interests of adolescent workers imperatively demand the establishment of day continuation schools, an additional argument in favor of such schools is that they would provide a means for making the night trade-extension work effective, through the use of continuation day school teachers for night school work. Such a plan would mean that teachers employed on this basis would have charge of a day continuation class during one session of four hours, and a night class of two hours, making a total of six hours' work per day. A plan of this kind would make possible the establishment of the fundamental conditions for successful trade—preparatory and trade-extension training in the night schools. The present system is unjust to both teachers and students;—to the students because the man or boy who sacrifices his recreation time to attend night school has a right to the best the schools can give; to the teachers because no teacher can work a two-hour night shift in addition to seven or eight hours in the technical high school without seriously impairing his efficiency.

The development of this plan would necessitate the establishment of two centers, one located in the eastern and one in the western section of the city.

In these centers should be housed the day vocational school, the day continuation classes, and the night vocational classes. This would relieve the technical high schools of a task which does not belong to them, and which by overloading the teachers seriously interferes with the work they were originally employed to do. At present a considerable number of the technical high school teachers are devoting from one-fifth to one-fourth of their total working day to elementary teaching, as most of the work in the night schools is below high school grade.

By bringing together all the trade preparatory and trade-extension work under one roof, it is possible to secure the highest efficiency in the use of equipment. Expensive shops can be justified only on the basis of constant use. If the suggestion for the establishment of a vocational school is acted upon, such future contingencies as the continuation school should be borne in mind in planning the buildings and equipment, so as to permit of extensions as they may be required. It is practically certain that universal continuation training for young workers up to the age of 17 or 18 will be made compulsory in all the progressive states of the country within the next decade. The Ohio school authorities should get ready to handle the continuation school problem before the example of other states and the overwhelming pressure of public opinion forces it upon them.

CHAPTER IX

VOCATIONAL TRAINING FOR GIRLS

The discussions in the preceding chapters have been limited intentionally to a consideration of the needs and possibilities of training for wage-earning pursuits in which men predominate. The conditions which surround vocational training for girls are so fundamentally unlike those encountered in the vocational training of boys that a combined treatment leads to needless complexity and confusion.

Cleveland uses a relatively smaller amount of woman labor than most other large cities. In only one of the 10 largest cities in the country—Pittsburgh—is the proportion of women and girls at work smaller as compared with the total number of persons in gainful occupations than in Cleveland. In 1900, 20.4 per cent of the workers in the city were women; by 1910 the proportion of women workers had increased to 22 per cent, a shift of less than two per cent for the decade.

A consideration of the occupational future of boys and girls shows at once how widely their problems differ. The typical boy in Cleveland attends school until he reaches the age of 15 or 16. About this period he becomes a wage-earner and for the next 30 or 40

years devotes most of his time and energy to making a living. The typical girl leaves school about the same time, becomes a wage-earner for a few years, then marries and spends the rest of her life keeping house and rearing children. To the man wage-earning is the real business of life. To the woman it is a means for filling in the gap between school and marriage, a little journey into the world previous to settling down to her main job.

The most radical and important difference between the two sexes with respect to wage-earning is found in the length of the working life. The transitory character of the wage-earning phase in the life of most women is clearly seen in the contrasted age distribution shown in Table 13.

TABLE 13.—PER CENT OF TOTAL POPULATION ENGAGED IN GAINFUL OCCUPATIONS DURING THREE DIFFERENT AGE PERIODS

Age period	Women	Men
16 to 21	60	85
21 to 45	26	98
45 and over	12	85

Approximately 85 per cent of the boys and slightly less than 60 per cent of the girls between the ages of 16 and 21 are at work. In the next age group—21 to 45—given by the census, 98 per cent of the men are at work, but the proportion of women employed in gainful occupations drops to 26 per cent, or about one in four; in the next age group—45 and over—

it falls to about 12 per cent, as compared with 85 per cent of the men. Of the women still at work in the older age group, over one-half are engaged in domestic and personal service as servants, laundresses, housekeepers, etc.

TABLE 14.—NUMBER EMPLOYED IN THE PRINCIPAL WAGE-EARNING OCCUPATIONS AMONG EACH 1,000 WOMEN FROM 16 TO 21 YEARS OF AGE

Manufacturing and mechanical industries:	
Apprentices to dressmakers and milliners	4
Dressmakers and seamstresses (not in factory)	20
Milliners and millinery dealers	17
Semi-skilled operatives:	
Candy factories	6
Cigar and tobacco factories	15
Electrical supply factories	10
Knitting mills	11
Printing and publishing	8
Woolen and worsted mills:	
Weavers	5
Other occupations	7
Sewers and sewing machine operators (factory)	53
Tailoresses	25
Transportation:	
Telephone operators	19
Trade:	
Clerks in stores	28
Saleswomen (stores)	35
Professional service:	
Musicians and teachers of music	6
Teachers (school)	4
Domestic and personal service:	
Charwomen and cleaners	5
Laundry operatives	13
Servants	81
Waitresses	9
Clerical occupations:	
Bookkeepers, cashiers, and accountants	26
Clerks (except clerks in stores)	20
Stenographers and typewriters	62

The occupations in which the girls now in the public schools will later engage can be determined with a relative degree of accuracy by employing a method in general similar to that utilized in forecasting the occupations of boys. It must be taken into account, however, that the wage-earning period for women, except in the professional occupations, usually begins

before the age of 21. For this reason the 16 to 21 age group probably offers the best basis for determining the future occupational distribution of girls in school. If all women at work up to the age of 25 were included the figures would be more nearly exact, but unfortunately data for the period between 21 and 25 are not available. The figures at the right of Table 14 show the number engaged in each specified occupation among each thousand women in the city between the ages of 16 and 21. The proportions given for the professional occupations, particularly teaching, are too small, because of the fact that few women enter the professions before the age of 21.

Applying these proportions to the average elementary school unit, it will be seen at once that the number of girls old enough to profit by special training is too small in any single occupation to form a class of workable size. In such a school there would be about 80 girls 12 years old and over. Of the skilled occupations listed in the table stenography and typewriting offers the largest field of employment, yet the number who are likely to take up this kind of work does not exceed five or six.

Differentiation in the Junior High School

The organization of the junior high school, where the enrollment is made up entirely of older pupils, obviates this difficulty to some extent. Instead of 80 girls there are from 300 to 500, with a corresponding increase in the number who will enter any given wage-earning occupation.

Not less than one-eighth and probably not more than one-fifth of these girls will become needle-workers of some kind. They will need a more practical and intensive training in the fundamentals of sewing than is now provided by the household arts course. The skill required in trade work cannot be obtained in the amount of time now devoted to this subject. It should be made possible for a girl who expects to make a living with her needle to elect a thoroughly practical course in sewing in which the aim is to prepare for wage earning rather than merely to teach the girl how to make and mend her own garments. As proficiency in trade sewing requires first of all ample opportunity for practice, provision should be made for extending the time now given to sewing for those girls who wish to become needle workers. This can easily be done through the system of electives now in use. The establishment of classes in power machine operating during the junior high school period appears to be impracticable, due to the immaturity of the girls and the small number who could profit by such instruction.

A discussion of the present sewing courses in the public schools will be found in Chapters XIV and XV, which summarize the special reports on the Garment Trades and Dressmaking and Millinery. In the present chapter the consideration of these occupations is limited to an examination of the administrative questions connected with training for the sewing trades.

Specialized Training for the Sewing Trades

The compulsory attendance law requires all girls to attend school until they are 16 years old. This forces a considerable number into the high schools for one or two years before they go to work. As a rule the type of girl who is likely to enter the needle trades selects the technical high school course, not because she has any idea of finishing it, but because she believes it offers a less tiresome way of getting through her last one or two years in school than the academic course. The technical course requires three and three-quarter hours a week of sewing during the first two years. The student may elect trade dressmaking and millinery during the third and fourth years.

Very few girls who can afford to spend four years in high school ever become dressmakers or factory operatives. If the school system is to do anything of direct vocational value for them it will have to begin further down. Most of them leave school before the age of 17 and the years between 14 and 16 represent the last chance the school will have to give them any direct aid towards preparation for immediate wage-earning.

For successful work in machine operating the class must be large enough to warrant the purchase and operation of sufficient equipment to give the pupils an opportunity for intensive practice. The only way this condition can be secured is by concentrating in large groups the girls who need such training. Little will be accomplished in training for the sewing

trades without specialization, and specialization in small administrative units is impossible. The teaching and operating cost in a school enrolling, say 200 girls, who want the same kind of work, can be brought within reasonable bounds. In a school where the total number who need specialized training does not exceed 10 or 15 the cost is prohibitive.

In the opinion of the Survey Staff a one or two year vocational course in the sewing trades should be established. The entrance age should not be less than 15. Courses should be provided for intensive work in trade dressmaking, power machine operating, and trade millinery. A conservative estimate of the number of girls who could be expected to enroll for courses in these subjects is 500. A trade school might be established where only this type of vocational training would be carried on, or it might be conducted in the same building with the trade courses for boys recommended in a previous chapter. In either case the number of pupils would be sufficient to warrant up-to-date equipment and a corps of specially trained teachers.

Training for the sewing trades consumes more material than any other kind of vocational training. For this reason economical administration requires some arrangement for marketing the product. During the latter part of the course the school should be able to turn out first-class work. The familiarity with trade standards the pupils obtain through practice on garments which must meet the exacting demands of the buying public has a distinct educational

value. The Manhattan Trade School for Girls in New York City and other successful schools in the country operate on this basis. There is reason to believe that there would be little difficulty in making arrangements with the clothing manufacturers in Cleveland to furnish a good trade school as much contract work as the classes could handle.

Other Occupations

From one-fourth to one-fifth of the girls in the school will later enter employment in commercial and clerical occupations, as stenographers, typists, clerks, cashiers, bookkeepers, saleswomen, and so on. Their needs will be considered in Chapters XII and XIII, in which the findings of the special reports on Boys and Girls in Commercial Work and Department Store Occupations are summarized.

A relatively small number will become semi-skilled operatives in industrial establishments, such as job printing houses, knitting mills, and factories making electrical supplies, metal products, and so on. As a rule such work requires only a small amount of manual skill or deftness. Not much training is needed and it can be given quickly and effectively in the factories.

About one-ninth of the girls in the school will enter paid domestic or personal service of some kind. The household arts courses probably meet the needs of girls who may be employed in such occupations as far as they can be met under present conditions.

The woman domestic servant occupies about the same social level as the male common laborer, and a course which openly sets out to train girls to be servants is not likely to prosper. The load of social stigma such work carries is too heavy. At some time in the future it may be possible to ignore the traditional and universal attitude of our public toward the so-called menial occupations sufficiently to consider training servants. At present such a possibility seems remote.

CHAPTER X

VOCATIONAL GUIDANCE

Very few of the army of young people who become wage earners each year take up the occupations in which they engage as the result of any conscious selection of their own or of their parents. They drift into some job aimlessly and ignorantly, following the line of least resistance, driven or led by the accidents and exigencies of gaining a livelihood. They possess no accurate or comprehensive knowledge of the advantages and disadvantages of different types of wage earning occupations, and frequently take up work for which they are entirely unfitted or which holds little future beyond a bare livelihood.

The Work of the Vocational Counselor

The plan now followed in the technical high schools of the city, by which one teacher in the school specially qualified for such work is charged with the duty of advising pupils who leave school and aiding them in securing desirable employment, could be adapted to the junior high school, where the need for service of this kind is even greater than in the technical high schools. Such work requires men who have

had some contact with industrial conditions, and who possess sound judgment, common sense, and a fairly comprehensive knowledge of the local industries. If the curriculum embraces the course in "Industrial Information" suggested in a previous chapter, the teacher of this subject might well be designated as vocational counselor for the boys in the school. A course similar in nature should be provided for the girls and a woman teacher selected to advise them when they leave school. Considerable difficulty probably will be experienced in securing women teachers competent to assume this task, but any wide-awake teacher who will devote some attention to published studies of industrial conditions and get in touch with the local organizations engaged in the investigation of wage earning employments, such as the Consumers' League and the Girls' Vocation Bureau, can soon acquire a fund of information that will enable her to offer valuable suggestions and advice to girls who expect to become wage earners.

The vocational counselor must guard against conventional thinking and the mass of "inspirational" nonsense which forms the main contribution to the vocational guidance of youth provided in the average schoolroom. The ideals of success usually held up before school children seem to have been drawn from a mixture of Sunday school literature and the prospectuses of efficiency bureaus. Boiled down the rules prescribed for their attainment are two: first, "Be good;" and second, "Get ahead." The pupils are told about well-known men who became famous

or rich, usually rich, by practicing these rules. Occasionally there is some prattle about the "dignity of labor," as a rule meaningless in the light of our current ideas of success. We do not think of a well-paid artisan as "successful." His success begins when he is promoted to office work, or becomes a foreman.

The inherent difficulty with ideals of success which demand that the worker become a boss of somebody else is that the world of industry needs only a relatively small number of bosses. Theoretically it is possible for any individual to reach the eminence of boss-ship. In real life less than one-tenth of the boys who enter industrial employment can rise above the level of the journeyman artisan, at least before later middle age, because only about that proportion of bosses are needed.

The task of the vocational counselor will consist in putting the pupil's feet on the first steps of the ladder rather than showing him rosy pictures of the top of it. For the great majority the top means no more than decent wages. This, after all, is a worthy ambition, frequently requiring the worker's best efforts for its realization.

The Girls' Vocation Bureau

The Girls' Vocation Bureau, for the placement of girls and women in wage-earning employment, has been in operation about six years. At present it is under the general charge of the state and municipal

employment bureau, although part of the funds for the support of the bureau is raised through private subscription. From July, 1914, to July, 1915, the Bureau secured positions for nearly 11,000 girls and women. Of these approximately 12 per cent were girls under 21. In many instances only temporary employment is secured, although efforts are made to place the girls in permanent positions. More girls are placed in office positions than in any other line of work, but a considerable proportion take employment in factories, domestic service, restaurants, and stores.

A careful record is kept of each applicant's qualifications, home conditions, the names of employers, etc. The Bureau endeavors to keep in touch with the girls after they are placed through follow-up reports and visits by members of the office staff or by volunteer investigators.

This spring every school in the city was visited by representatives of the Bureau in the endeavor to interest principals in the work of placement, and arrangements were made for sending to the Bureau lists of the girls who were expected to leave school permanently. This effort met with slight success, as only about 100 girls were reported from all the schools in the city, although the number of girls leaving school each year from the elementary grades alone is over 2,000. In all cases the girls were visited by a representative of the Bureau and urged to return to school, or if they were determined to seek

employment the advantages of registering in the Bureau were brought to their attention.

It is to be hoped that more effective coöperation between the Bureau and the schools can be established and that plans for a placement bureau for boys similar in method and aim to the Girls' Bureau may be realized. The matter of placement is the most difficult part of the vocational counselor's duties, and an arrangement whereby the vocational guidance departments of the various schools might serve as feeders to a central placement bureau would probably in the long run give the best results. Both guidance and placement are new things in the public schools and efficient methods of administration can be worked out only through trial and experiment.

CHAPTER XI

CONCLUSIONS AND RECOMMENDATIONS

1. The future occupations of the children in school will correspond very closely to those of the native-born adult population. The occupational distribution of the city's working population therefore constitutes the best guide as to the kinds of industrial training which can be undertaken profitably by the school system.

2. Industrial training in school has to do chiefly with preparation for work in the skilled trades. Training for semi-skilled occupations can be given more effectively and cheaply in the factories than in the schools.

3. As a rule, industrial training is not practicable in elementary schools, for the reason that the number of boys in the average elementary school who are likely to enter the skilled trades and who are also old enough to profit by industrial training is too small to permit the organization of classes.

4. The most important contribution to vocational education the elementary schools can make consists in getting the children through the course fast enough so that two or three years before the end of the compulsory attendance period they will enter an inter-

mediate or vocational school where some kind of industrial training is possible.

5. The survey recommends the establishment of a general industrial course in the junior high school, made up chiefly of instruction in the applications of mathematics, drawing, physics, and chemistry to the commoner industrial processes. The course should also include the study of economic and working conditions in the principal industrial occupations.

6. One or two vocational schools equipped to offer specialized trade training for boys and girls between the ages of 14 and 17 are needed. At present a gap of from one to two years exists between the end of the compulsory attendance period and the entrance age in practically all the skilled trades, which could well be employed in direct preparation for trade work. Such schools would relieve the first and second year classes of the technical high schools of many pupils these schools do not want and cannot adequately provide for. General as well as special courses should be offered, although pupils should be encouraged to select a particular occupation and devote at least one year to intensive preparation for it.

7. The survey favors the extension of the compulsory attendance period for boys to the age of 16. The industries of Cleveland have little or nothing worth while to offer boys below this age.

8. The best form of trade-extension training is that provided in a few establishments which maintain apprentice schools in their plants. This plan is feasible only in large establishments. It will never take

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care of more than a small proportion of the young workers who need supplementary technical training.

9. Plans for trade-extension training of apprentices depending on the coöperation of employers have met with slight success. The principle difficulty is that the sacrifices they involve are borne by a relatively small number of employers while the benefits are reaped by the industry in general. Either the industry as a whole or the community should bear the cost of such training.

10. The vocational interests of young workers and the social interests of the community demand the establishment of a system of continuation training for all young people in employment, up to the age of 18 years. The classes should be held during working hours and attendance should be compulsory.

11. The enrollment in the trade classes of the night schools is far below what it should be in a city as large as Cleveland. The relatively small result now obtained is not the fault of the schools, but is due mainly to the fact that the field of vocational evening instruction is treated by the school system as a mere side line of the technical high schools.

12. The survey recommends the organization of all forms of continuation, night vocational, and day vocational training under centralized full-time leadership. Only in this way can there be secured a type of organization and administration sufficiently elastic and adaptable to meet the widely varying needs of the working classes.

13. Industrial training for girls will consist in the

main of preparation for the sewing trades. Practically no other industrial occupations in which large numbers of women are employed possess sufficient technical content to warrant the establishment of training courses in the schools. The survey recommends a practical course of needle instruction in the junior high school and the introduction in the vocational schools of specialized courses in dressmaking, power machine operating, and trade millinery for the older girls who wish to enter these trades.

14. The present experiment in vocational guidance and placement should be extended as rapidly as possible. Courses in vocational information should be offered in the junior high school and vocational counsellors appointed to advise pupils in the selection of their future vocations and aid them in securing desirable employment when they leave school. The full measure of success in this work demands better coöperation with outside agencies on the part of teachers and principals than has been secured up to the present time.

CHAPTER XII

SUMMARY OF REPORT ON BOYS AND GIRLS IN COMMERCIAL WORK

Particular attention is given throughout this report to the differences which exist between boys and girls in commercial employment with respect to the conditions which govern success and advancement. The majority of boys begin as messengers or office boys and subsequently become clerks or do bookkeeping work. As men they remain in these latter positions or, in at least an equal number of cases, pass on into the productive or administrative end of business. The majority of girls are stenographers, or to a less extent, assistants in bookkeeping or clerical work. Boys' work may be expected to take on the characteristics of the business that employs them; girls' work remains in essentials unchanged even in totally changed surroundings. Boys' work within limits is progressive; girls' work in its general type—with individual exceptions—is static. Boys as a rule cannot stay at the same kind of work and advance; girls as a rule stay at the same kind of work whether or not they advance. Boys in any position are expected to be qualifying themselves for "the job ahead," but for girls that is not the case. Boys may

expect to make a readjustment with every step in advancement. Each new position brings them to a new situation and into a new relation to the business. Girls receive salary advancement for increasingly responsible work, but any change in work is likely to be so gradual as to be almost imperceptible if they remain in the same place of employment. If they change to another place, those who are stenographers have a slight readjustment to make in getting accustomed to new terms and to the peculiarities of the new persons who dictate to them. Bookkeeping assistants may encounter different systems, but their part of the work will be so directed and planned that it cannot be said to necessitate difficult adaptation on their part. The work of clerical assistants is so simple and so nearly mechanical that the question of adjustment does not enter. These girl workers do not find that the change of position or firm brings them necessarily into a new relation to the business.

Even moderate success is denied to a boy if he has not adaptability and the capacity to grasp business ideas and methods; but a comparatively high degree of success could be attained by a girl who possessed neither of these qualifications. A boy, however, who has no specific training which he can apply directly and definitely at work would be far more likely to obtain a good opening and promotion than a girl without it would be.

The range of a boy's possible future occupations is as wide as the field of business. He cannot at first be trained specifically as a girl can be because he does

not know what business will do with him or what he wants to do with business. The girl's choice is limited by custom. She can prepare herself definitely for stenography, bookkeeping, and machine operating and be sure that she is preparing for just the opportunity—and the whole opportunity—that business offers to her. Her very limitation of opportunity makes preliminary choice and training a definitely possible thing.

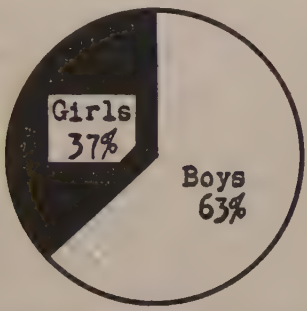

Diagram 1.—Boys and girls under 18 years of age in office work in Cleveland. Data from report of Ohio Industrial Commission, 1915

The difference between boys and girls begins at the beginning. Boys are given a larger share of the positions which the youngest worker can fill. Diagram 1 illustrates this and the figures of the United States Census for 1910 clearly corroborate it. Boys are taken for such work and taken younger than girls, not merely because the law permits them to go to work at an earlier age, but also because business

itself intends to round their training. Girls, on the contrary, are expected to enter completely trained for definite positions. This fact alone would in most cases compel them to be older. Furthermore, because boys in first positions are looked upon as potential clerks, miscellaneous jobs about the office have for them a two-fold value. They give the employer a chance to weed out unpromising material; and they give boys an opportunity to find them-

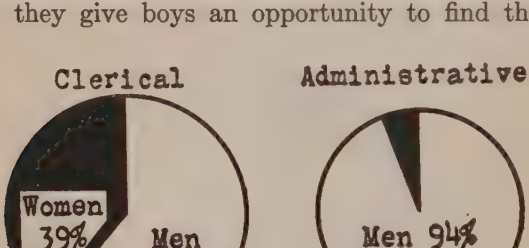

Diagram 2.—Men and women 18 years of age and over in clerical and administrative work in offices in Cleveland. U. S. Census, 1910

selves and to gather ideas about the business and methods which they may be able to make use of in later adjustments.

Diagram 2 shows that girls' training, if it is to meet the present situation, must prepare for a future in specialized clerical work; boys' future must apparently be thought of as in mostly the clerical and administrative fields. The term "clerical" as here used, covers bookkeepers, cashiers and accountants,

stenographers and typists, clerks and a miscellaneous group of younger workers such as messengers, office boys, etc. "Administrative" covers proprietors, officials, managers, supervisors, and agents, but it does not include salespeople.

The usual commercial course gives impartially to boys and girls two traditional "subjects" which they are to apply in wage earning whatever part of the wage earning field they may enter. These are stenography and bookkeeping. The evidence collected during the survey shows that these are rarely found in combination except in small offices. Of the men employed who are stenographers, the majority are of two kinds: (1) those who use stenography incidentally with their other and more important work as clerks, and (2) those for whom stenography is but a stepping-stone to another kind of position. The only firms which make a practice of offering ordinary stenographic positions for boys are those which restrict themselves to male employees for every kind of work.

Independent stenographic work of various kinds is of course open to the sexes alike. In Cleveland there are a few women in court stenography. The 10 public stenographers' offices were found upon inquiry to include two men and 10 women. No figures regarding convention reporters were obtainable. In the positions of the bookkeeping group also there was some sex difference. The accountants, bookkeepers, cashiers, pay-masters and other persons of responsibility are, in large offices where both sexes

work together, much more likely to be men than women; the assistants who work with these may be of either sex, but girls and women are likely to make up the greater portion. Of the small office this is less generally true. Boys who do machine operating are usually clerks whose machine work, as in the case of stenography, is merely an adjunct to other work; with girls machine operating is either the whole of the position or the most important part of it.

The essential difference between the clerkship which boys for the most part hold and the general clerical work which girls do is that the boys' work is unified and is a definite, separate responsible part of the business, usually in line for promotion to some other clerkship; the girls' is a miscellany of more or less unrelated jobs and is not a preparation for specific promotion.

A General View of Commercial Work

All commercial occupations may be roughly divided into two classes: those which have to do with administrative, merchandising, or productive work, and those which carry on the clerical routine which the others necessitate. The first class of occupations may be designated by the term "administrative work" and the second by "clerical work." A varying relation exists between the two which depends chiefly upon the kind of business represented. In some kinds clerical work is the stepping stone by which

administrative work is reached; in others employment in clerical work side-tracks away from the administrative work.

There is, of course, a future of promotion within the limits of clerical work without reference to its relation to administrative work. The practical aspect of it is, in most kinds of business, that the subordinate clerical positions far outnumber the chief ones. Promotion of any sort depends largely upon individual capacity; but this general distinction may be made between promotion in clerical work and in administrative work; in the clerical field it tends to be automatic but limited; in administrative work it comes more often through a worker's initiative or individuality than through automatic progression and it has no arbitrary limits.

Obviously one kind of person will be adapted to an administrative career; another to a clerical one. Even a beginner in wage earning might be able to classify himself on a basis like this; yet it is not essential, for in many cases it is possible that his first positions recognize this choice. He needs fundamental experience in business methods whatever he is going to do; and for most administrative positions he needs maturity. He can achieve both by serving an apprenticeship in some form of clerical work. The important things for him in the early part of his career are to understand the distinction between the two classes of occupations; to sense the relation he holds to the business as a whole; and to act intelligently in the matter of making a change.

Bookkeeping

The bookkeeping which modern business, except in the small establishment, demands of young workers is certainly not the journal and ledger bookkeeping of the commercial schools. A modern office organization may have in its bookkeeping department of 20 persons only one "bookkeeper." This person is responsible for the system and he supervises the keeping of records and the preparation of statements. A minority of his assistants will need to be able to distinguish debits from credits; the rest will be occupied in making simple entries or in posting, in verifying and checking, or in finding totals with the aid of machines. The bookkeeping systems employed show wide variation, not only in different kinds of business, but in different establishments in the same kinds of business. Many firms are using a loose-leaf system; some use ledgers; and others have a system of record keeping which calls for neither of these devices. Bookkeeping work, especially in the positions held by girls, is frequently combined with comptometer or adding machine work, with typing, billing, filing, or statistical work; but rarely, except in the small office, are bookkeeping and stenography—the Siamese Twins of traditional and commercial training—found linked together.

Stenography

Stenography is used throughout business chiefly in correspondence; to a less extent for report and state-

ment work, for legal work, and for printer's copy. The stenographer in any business office, more than other clerical workers, is supposed to look after a variety of unorganized details including the use of office appliances, the filing of letters, and sometimes dealing with patrons or visitors in the absence of the employer. She is more important to the employer in his personal business relations than any other employee, except in the case of those few employers who have private secretaries.

Clerks' Positions

In the case of large corporations, which are by far the largest employers of clerks, this work has been standardized to a marked degree. The organization of the office work of the telegraph, telephone, and express companies, the railroads, and the occasional large wholesale company in Cleveland is a nearly exact duplication of that of other district or division offices controlled by these companies in other cities. The same is true of the Civil Service. Whatever effects standardization may have upon opportunity, it obviously makes for definiteness in regard to training requirements. All the positions are graded on the basis of experience and responsibility and a logical line of promotion from one to another has been worked out.

The report contains detailed studies of different kinds of clerical work in the offices of transportation and public utility corporations, retail and wholesale

stores, manufacturing establishments, banks, the civil service, and small offices employing relatively few people. In each of these such matters as character of the work, opportunities for advancement, kind of training needed and special qualifications are taken up.

Wages and Regularity of Employment

Stated briefly the conclusions of the report with respect to wages and regularity of employment in office positions are as follows:

The wage opportunities for clerical workers, especially men, lie in business positions outside the limits of clerical work. Men clerical workers average about the same pay as salesmen and more pay than industrial workers. Women clerical workers receive more than either saleswomen or industrial workers. Employment is much more regular in clerical work than it is in salesmanship or industrial work. For men clerical workers the wage opportunity is better in manufacturing and trade than in some kinds of transportation business. For women it is better in manufacturing and transportation than it is in trade. Men's wages tend to be higher than women's in all branches of clerical work.

Among the clerical positions, bookkeeping shows the highest wage average for men; clerks' positions show the lowest. Stenography shows the highest for women; machine work the lowest. Men bookkeepers show their best wage average in the wholesale busi-

ness, clerks in transportation, and stenographers in manufacturing. The small office gives better wage opportunity to women bookkeepers and men stenographers; the large office favors women stenographers and men clerks.

For boys, there is some indication that advanced education and commercial training, in their present status, are less closely related to high wages than are personal qualities and experience. For girls, the combination of high school education and business training is the best preparation for wage advancement. A general high school education and usually, business training, are essential to the assurance of even a living wage. Business training based upon less than high school education is almost futile.

The Problem of Training

Six chapters of the report are devoted to a consideration of the needs and possibilities of training. The work now being done in the public schools of the city is discussed in detail, with suggestions for a better adaptation of the courses of study and methods and content of instruction to the needs of boys and girls who wish to prepare themselves to enter clerical occupations. The observations on training for such work may be summarized as follows:

Commercial training should be open to all students whom commercial subjects and methods can serve best; but graduation should depend upon a high standard of efficiency.

Statistics show that commercial training is not to be looked upon, in a wholesale way, as a successful means of taking care of backward academic students.

Commercial students' need for cultural and other supplementary education may be even greater than that of academic students.

The graduation rate of commercial students in public schools has been increased since the organization of a separate commercial high school and the number of students entering has been decreased.

Commercial high schools receive a grade of children who are about medium in scholarship and normal in age.

Commercial and academic high school teachers are similar in scholastic preparation and in the salaries they are paid.

The Cleveland Normal School does not prepare definitely for the teaching of commercial subjects. Commercial teachers are nominally supervised by the district superintendents.

Public schools receive 29 per cent of the city's day commercial students. The private schools receive a few more than the sum of public, parochial, and philanthropic schools.

Public schools receive 22 per cent of the city's night commercial students. The private schools receive more than twice as many as the public and philanthropic schools. There are no night commercial classes in parochial schools.

The length of the day course in most private

schools is eight months or less; in public schools it is four years.

The public school, if it believes in longer preparation for commercial work than most private schools give, should demonstrate the reason to parents and children.

Training for boys and girls should be different in content and in emphasis.

The usual course of study in commercial schools is suitable for girls and unsuitable for boys.

A girl needs, chiefly, specific training in some one line of work. She has a choice among stenography, bookkeeping, and machine operating.

A boy needs, chiefly, general education putting emphasis on writing, figuring, and spelling; general information; and the development of certain qualities and standards.

For students electing to go into commercial work, general education may be taught more effectively through the medium of commercial subjects than through academic ones.

Boys' training looks forward to both clerical work and business administration; but as clerical work is a preparation for business and is likely to occupy the first few years of wage earning, training should aim especially to meet the needs of clerical positions.

Clerical positions for boys cover a variety of work which cannot be definitely anticipated and cannot therefore be specifically trained for. But certain fundamental needs are common to all.

Most of the specialized training for boys should be given in night continuation classes.

Girl stenographers need a full high school course for its educational value and for maturity. Girls going into other clerical positions can qualify with a year or two less of education; but immaturity in any case puts them at a disadvantage.

Boys' training, for those who cannot remain in school, should be compressed into fewer than four years. Immaturity in the case of boys is not a great disadvantage.

Bookkeeping has general value in the information it gives about business methods and for its drill in accuracy. To some extent it may aid in the development of reasoning.

Much of the bookkeeping in actual use in business consists in making entries of one kind only and in checking and verifying. Understanding of debit and credit, posting, and trial balance, is the maximum practical need of the younger workers.

Penmanship demands compactness, legibility, neatness, and ease in writing; also, the correct writing and placing of figures.

The chief demand of business in arithmetic is for fundamental operations—adding and multiplying—also for ability to make calculations and to verify results mentally.

Undergraduate experience in school or business offices may be a valuable method of acquainting students with office practice and routine and with business organization and business standards.

CHAPTER XIII

SUMMARY OF REPORT ON DEPARTMENT STORE OCCUPATIONS

The field covered in this volume is limited to the business of retail selling as carried on in the department stores and some other stores of Cleveland. The retail stores considered can all be assigned to one of the three following classes: (1) The department store of the first rank which draws trade not only from the whole city and the suburbs but also from the towns and smaller cities of a large surrounding district; (2) the neighborhood store which does a smaller business within narrower limits, drawing its trade, as the name indicates, from the immediate neighborhood; (3) the five and ten cent store, well known by syndicate names, where no merchandise which must be sold above 10 cents is carried.

Department Stores

The five largest department stores in Cleveland employ about 5,800 people distributed among several mercantile departments, and in a variety of occupations that find a place in the industry. Of these 5,800 people approximately seven-tenths are women

and three-tenths are men; 90 per cent are over 18 years of age and 10 per cent are under 18.

The entire force of a store is sometimes arbitrarily divided by the management into "productive," and "non-productive" help. From 40 to 60 per cent of the employees were reported as actually taking in money, while the remainder, the "non-producers," were engaged in keeping the business going and making it possible for the "producers" to sell goods.

The greatest number of opportunities either for employment or promotion are in the selling force. This is often spoken as being "on the floor." Both boys and girls may find employment here, though a large majority of the sales force is made up of them. Speaking in general terms, men are only employed to sell men's furnishings, sporting goods, bulky merchandise, such as rugs, furniture, blankets, etc., and yard goods which are difficult to handle, such as household linens and dress goods. Positions as buyers and buyer's assistants are not restricted by sex and boys and girls may both consider them as a possible goal.

Neighborhood Stores

A neighborhood store is that type of department store which draws its trade from a comparatively limited area of which the store is the center. The kind of goods carried are practically the same as in the large department store and the variety of merchandise may be nearly as great; but the selection is more limited because of the small stock.

Promotion to selling positions is more rapid in the neighborhood stores than in regular department stores. One reason for this is that a larger proportion of the force is "productive," *i. e.*, selling. This proportion may run as high as 80 or even 90 per cent, as compared with the 40 to 60 per cent of "productive" help in large department stores.

Employment in these stores is looked upon as desirable preliminary training for service in larger department stores. This is the general opinion held by those who hire the employees in the larger stores. The selling experience gained in neighborhood stores is looked upon as general, in that it gives an acquaintance with a variety of merchandise rather than an extensive knowledge of any line of stock. This experience makes the employee adaptable and resourceful. Another advantage of neighborhood training for sales people is the fact that they are brought into closer human relations with the customer and thus learn the value of personality as a factor in making sales.

Five and Ten Cent Stores

Cleveland had in the fall of 1915 six large stores where nothing costing over 10 cents is sold. These belong to three syndicates or chains. To show the extent to which this business has developed it may be stated that the largest of these syndicates, which controls three of the six Cleveland stores, has 747 branches in different parts of the country.

The number of saleswomen in a single store ranges from 12 to 70. The total number in the six stores was approximately 226. The shift in this branch of retail trade is large, as there are continual changes in the selling force. One store reported the number of new employees hired in six months as being about equal to the average selling force.

The managers of the five and ten cent stores without exception stated that they preferred to hire beginners who were without store experience. The hours of work are longer and the conditions under which the work is done are more trying than is usually the case in the larger department stores.

The girl who expects her application for employment in the five and ten cent store to be accepted must be 18 years old in order that she may legally work after six o'clock. It is better for her to be without previous selling experience (unless in other five and ten cent stores), as employers in these stores prefer to train help according to their own methods.

Wages and Employment

The wages paid beginners in the department stores are fair as compared with other industries employing the same grade of help. Boys and girls when they first enter employment receive from $3.50 to $7, depending on the store where they get their first job. In addition to the salary most department stores give bonuses or commissions through which the members of the sales force may increase their com-

pensation. The Survey Staff worked out comparisons on the basis of data supplied by the State Industrial Commission between the earnings of workers in department store occupations and those in other

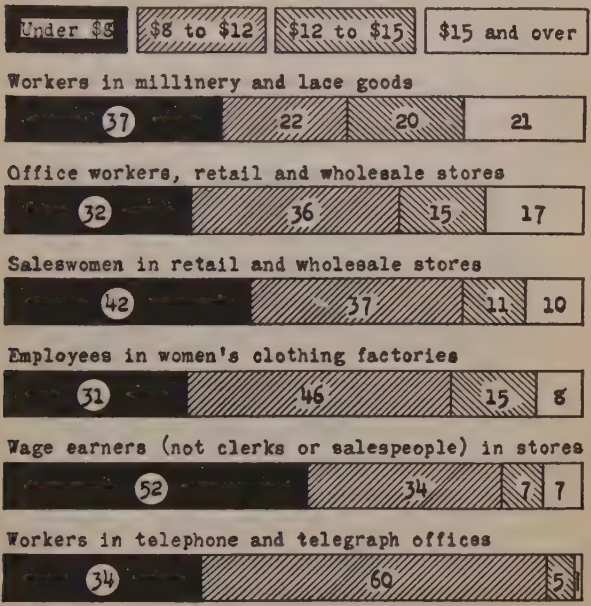

Diagram 3.—Per cent of women earning each class of weekly wages in each of six occupations

industries. Diagram 3 shows graphically a comparison of the wages of women workers in six different industries. An interesting point brought out by this graphic comparison is that retail trade constitutes a

much better field for women's employment as compared with the great majority of positions open to them in other lines than is commonly assumed to be the case. This is brought out even more clearly in Table 15, which compares, on a percentage basis, those who earn $12 a week and over, in all of the industries of the city employing as many as 500 women in 1914.

TABLE 15.—PER CENT OF WOMEN EMPLOYEES OVER 18 YEARS OF AGE EARNING $12 A WEEK AND OVER

Office employees, in retail and wholesale stores	31.8
Employees in women's clothing factories	22.5
Saleswomen in retail and wholesale stores	21.0
Employees in men's clothing factories	13.3
Employees in hosiery and knit goods factories	7.9
Employees in printing and publishing establishments	7.7
Employees in telephone and telegraph offices	6.3
Employees in laundries and dry cleaning establishments	4.4
Employees in cigar and tobacco factories	3.9
Employees in gas and electric fixtures concerns	3.2

If the data were for retail stores only and did not include wholesale stores, then office work, which now stands at the head of the list, would probably not make so good a showing, although the superiority over the selling positions is, from the wage-earning standpoint, so marked that there seems to be no escape from the conclusion that on the whole women office workers are better paid than women in the sales force. On the other hand the proportion of saleswomen earning $12 and over is from nearly seven times as great to not far from twice as great as it is in the factory industries, if we except the workers

in women's clothing factories, whose earnings per week are better than those of the saleswomen.

With respect to the men employed on the sales force of the department stores a somewhat different situation exists. In Diagram 4 a comparison is made of the wages paid in sales positions with the wages paid in clerical positions. Here it will be noted that men who sell goods in retail and wholesale stores earn more on the average than men occupying clerical positions, such as bookkeepers, stenographers, and

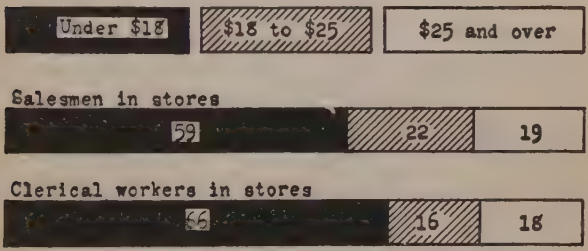

Diagram 4.—Per cent of salesmen and of men clerical workers in stores receiving each class of weekly wage

office clerks. This comparison does not include traveling salesmen. A further comparison of the earnings of the men in stores with the earnings of male workers (omitting office clerks) in the different industries of the city employing the largest number of men is given in Diagram 5, which shows the per cent in each industry earning $18 a week and over.

In comparing wages in stores with those in the manufacturing industries it must be not forgotten

that the working day and week in the larger stores is shorter than in most of the factories. Hence a comparison of earnings on the basis of wage per hour would show a still greater advantage in favor of both sales persons and clerical workers.

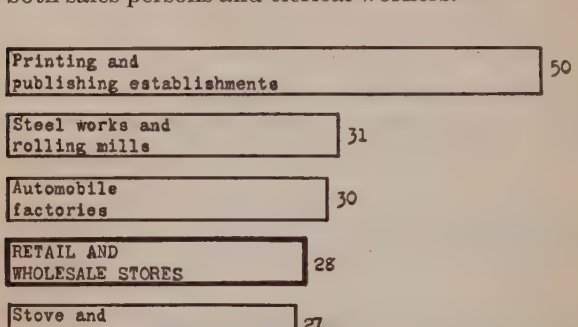

Diagram 5.—Per cent of male workers in non-clerical positions in six industries earning $18 per week and over

Regularity of Employment

In department store work and in nearly all branches of retail selling there is a marked fluctuation in the number employed during the year. Sales work in the department stores is seasonal in the sense that a large number of extra sales women are taken on during the Christmas season for a period of temporary employment, usually lasting from one to two months. The proportion of the total working force for the whole year employed in such transient jobs

is approximately one-fourth. How selling positions in retail and wholesale stores compare with other fields of employment in this respect is seen in Diagram 6.

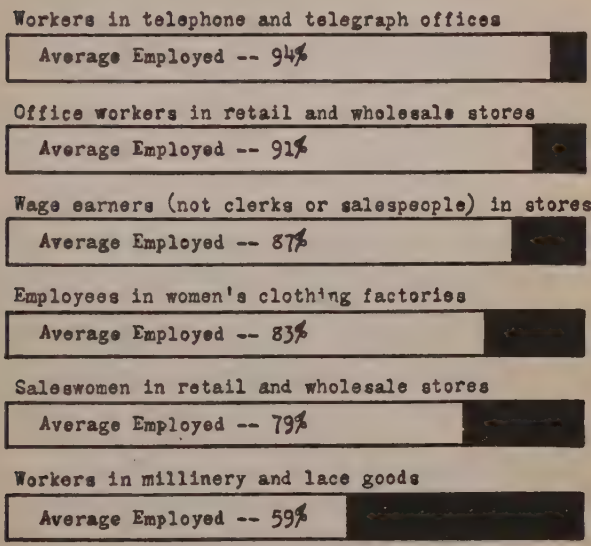

Diagram 6.—Per cent that the average number of women employed during the year is of the highest number employed in each of six industries

Opportunities for Advancement

In regard to promotion in department stores it should be noted that as a rule the executives are made in the business and are not, as in some industries, brought in from the outside because they

must have some special training which the organization itself does not provide. Not only in Cleveland but in other cities where studies of the same kind have been made it has been found that practically all the people holding important floor positions have come up from the ranks. The various lines of promotion through the different departments are analyzed in detail in the report.

The Problem of Training

That vocational training for department store employees is both desirable and possible is proved by the fact that most of the large stores in Cleveland make some provision for the instruction of their workers. Some of these classes are carefully organized and excellently taught with every promise of increasing in usefulness. Others employ methods of instruction which belong to the academic school of an earlier decade and give evidence that the problem of vocational training with which they are presumably concerned is not even understood.

From the standpoint of the school there are two well recognized kinds of training possible for department store employees: trade preparatory and trade extension training. Eventually it may prove practicable to organize instruction of both kinds, but it is the opinion of the author of the report that under present conditions the surest results can be expected from trade extension training. In trade extension instruction the members of the group to be dealt with

have already secured their foothold in the industry; and having mastered at least the rudiments of their job they have acquired a basis of experience which may be utilized for purposes of instruction. These people are responsive to teaching organized with regard to their needs, for daily experience is demonstrating to them their deficiencies.

The success of the proposed training will largely depend upon the employment of simple and direct methods that shall place this knowledge in the hands and head of the person or group needing it. The application of this instruction must be immediate and practical and must not be dependent upon the working out of a complicated course or schedule.

The organization must be flexible enough to admit of bringing together a group having a common need, although they may come from different departments of the business. Since the unit of class organization is not previous school experience or similar employment, it will be seen that this class should be held only until the need is fully supplied and should then give place to another organized on the same basis.

As in all vocational teaching, the size of the class should be limited. To make this work really effective, the instructor should come in sufficiently close contact with all pupils to enable him to obtain a personal knowledge of their needs and capabilities. A further necessity for small classes and individual instruction is found in the fact that there is a constant shift of employees in the industry as well as frequent accessions from the outside.

It readily can be seen that this is not a problem of the regular school and that it cannot be met by ordinary classroom methods. Part time or continuation classes, such as have already proved feasible for other kinds of trade instruction, are the most practicable methods of doing this work.

Classes for the instruction of employees are already maintained in the majority of large stores. The extension of this plan of separate responsibility is one way of meeting the problem. But this method has certain obvious faults. The unequal opportunity which it affords to department store employees as a body is a conspicuous drawback. The value of the instruction so given, moreover, will always depend to a large extent on the comprehension of the problem by the firm maintaining the classes. The method involves much duplication of effort, which is particularly wasteful when the instruction of small groups is involved.

Another possible method would be for the several department stores to get together and coöperate in providing instruction. There would seem to be no reason why stores should not unite for this purpose as well as for any other. The advantages of this method are economy of maintenance and administration, the ability to command expert service, and the possibility of securing and sharing the results of a great variety of such experiences as does not consist of exclusive trade secrets.

The number of people whom it would be necessary to employ exclusively for the purpose of conducting

these classes would be small as compared with the results accomplished. Collectively these stores now have in their employ a body of highly paid experts in all lines of merchandise. A large amount of the most accurate technical knowledge covering the work of all departments is already available in the several stores. These are valuable resources which should be utilized by a coöperative school of this kind.

For the head of such a school, it would be desirable to secure a man or woman of more than usual ability and discernment who, above all else, could sense the business and routine of each contributing store from the standpoint of the employee and of store organization. It would be the business of this person to become familiar with the available sources of knowledge in the different stores and then arrange for the presentation of this knowledge to the various classes. By coöperation with the floor men, heads of sections and departments, as well as with the employees themselves, he should come into close contact with the requirements of the workers and should gather from the different stores those who, because of their common need, can be made into a "school unit." It would also be necessary to employ assistants of practical experience who would attend to the details of routine teaching, and act as interpreters for those experts who have the knowledge but not the ability to impart it even to a small class.

It is realized that a scheme of this kind would involve the overcoming of many objections and diffi-

culties of adjustment before it could be put into actual operation. It would necessitate mutual concessions and forbearance on the part of everybody concerned, but the results would unquestionably justify the labor.

A third method, already in operation in Boston, New York, and Buffalo, calls for the coöperation of the stores and the schools. This partnership, it is claimed, makes certain that the needs of the pupil are considered before the demands of the business. It insures equal opportunity for all employees so far as instruction is concerned and it divides the expense of maintenance between the industry and the school. It is to be regretted that this scheme frequently results in the employment of teachers who, although certificated for regular school work, have no other qualifications, instead of persons of practical experience. The employment of such teachers too often leads to the following of ordinary school practices and academic traditions rather than the methods and practice of business.

In some quarters it is maintained that this instruction should be entirely taken over by the public schools, thus relieving the store of any responsibility in the matter. It is probably not now advisable for the school to assume full responsibility for such training. The heavy expense involved and the physical limitations of the schools would make it difficult, without the coöperation of the store, to reproduce the trade atmosphere necessary for real vocational training. As a result, the instruction would become

abstract and theoretical, with the major portion of the effort limited to a continuation of elementary school subjects taught with reference to their application to department store work.

Character of the Instruction

The analysis of the industry shows that in each occupation or job there is a definite amount of knowledge which must be acquired by the efficient worker. A study of this analysis and of the examples of technical knowledge needed by the worker at different points in the industry will show that no such thing as a general course is possible. In every case the character of the instruction should be such that it will answer a definite need of the employee. What this instruction should be in specific cases can be settled only, on the one hand, by a thorough analysis of the occupation to determine what demands it makes upon the workers, and on the other, by a careful study of the workers themselves to ascertain how far they have been unable to meet these demands without assistance. Lessons can then be organized dealing with such subject matter as individuals or groups have failed to grasp, the lack of which limits their efficiency or restricts their usefulness. It can readily be seen that this instruction will cover a wide range of subjects, from the use of fractions needed by checkers and salesgirls in yard goods sections, to the special technical knowledge of fine furs required by the salesperson who handles this merchandise.

The method by which this instruction can best be given is in a series of short unit courses. In every case the length of the course is to be determined by the subject matter. For instance, two one-half hour lessons may be a "course," when this time is sufficient for the necessary teaching.

The group or class to which this instruction is given might be made up of those who need the same technical knowledge, although they might expect to make a different application of this instruction. For instance, the unit course on silks might be given to a group composed of salespeople from the silk section, the waists and gowns section, and the section of men's neckwear.

The report gives detailed examples of the kinds of technical knowledge needed in the different departments of the store. It maintains that such instruction cannot be successfully given by regular school teachers. As in other industries the teacher needs actual experience in the occupation for which training is given. Academic training and teaching experience are desirable and valuable, but among the qualifications demanded of a teacher of this kind they are of secondary importance.

The final chapter of the report contains valuable instructions for young persons who desire to secure positions in retail trade. These instructions cover such matters as work papers, methods of securing a position, and requirements for employment in various kinds of department store work.

CHAPTER XIV

SUMMARY OF REPORT ON THE GARMENT TRADES

The clothing industry in Cleveland has grown very rapidly in recent years. During the 10 year period from 1900–10 the number of persons employed in the industry increased approximately 100 per cent. This increase was much greater than the increase throughout the country as a whole and was more than twice as large as the increase in the population of the city. There is every indication that this rapid growth is still continuing. It is estimated that approximately 10,000 workers are employed in the industry at the present time.

The distribution of men and women in the industry is most interesting. The making of men's garments has been more fully standardized and is subject to fewer changes than the making of women's garments. In this standardized and systematized branch of the industry the women now outnumber the men. In the manufacture of women's garments, where the styles change more frequently and the work is of a more varied character, more men than women are employed.

The methods of work are of three general types:

The old tailoring system known as "team work," or a slight modification of it; piece operating; and section work. Under the team system, used extensively in the making of women's coats, a head tailor hires his own helpers (operators and finishers), supervises them and pays them by the week out of the lump sum he receives for the garments from the clothing establishment. Under the piece operating system each operator sews up all the seams on one "piece," or garment, and each finisher does all the hand sewing on one garment. Each operator and each finisher is an independent worker. The whole body of finishers keeps pace with the whole body of operators. Piece operating is used almost entirely in dress and skirt making, and to some extent in coat making. The section system is based on the subdivision of processes into a number of minor operations. The workers are divided into groups, each group making a certain part of the garment. The various operations are divided into as many minor operations as the number of workers and quantity and kind of materials will warrant. Each of these minor operations is performed by operators who do nothing else. This specialization has been carried to a high degree in the manufacture of men's clothing, and section work is increasingly used on women's coats.

Characteristics of the Working Force

One of the objects of the study was to find how many positions there are for men and women in each occu-

pation in the industry. Through the coöperation of employers data were obtained from the records of 50 establishments employing a total of 8,337 garment workers, approximately four-fifths of the total number in the city. The distribution of workers by sex in the various occupations is shown in Diagram 7. The apportioning of work to the two sexes seems to depend partly upon the weight of materials and partly upon previous training. The men are mostly foreign born tailors who have had the kind of training necessary for the more complicated work. The women are largely American born of foreign parentage, trained in American shops and employed chiefly upon operations that may be learned in a relatively short time. Cutting and pressing are practically monopolized by men. Nearly all hand sewers are women, except for a few basters on men's clothing. Most designers are men, although a few women designers are found in dress and waist shops.

In the largest trade,—machine operating,—about two-thirds of the workers are women. In no trade in which both sexes are employed is the difference in their work more apparent. The weight of materials decides to some extent the division of operating between men and women. Some employers are of the opinion that garments made of such thick materials as plush, corduroys, and cheviots are too heavy to be manipulated under needle machinery by women and consequently employ only men operators. Where light weight materials are used, as in the manufacture of dresses and waists, delicacy in hand-

Diagram 7.—Distribution of 8,337 clothing workers by sex in the principal occupations in the garment industry

ling is required, and nearly all the operators are women.

Four-fifths of the men and two-fifths of the women employed in the industry are of foreign birth and the majority of the native born workers are of foreign parentage. There is an increasing demand for workers who understand English, due to the fact that they are able to follow directions more intelligently.

There are relatively few workers under the age of 18. Many firms will employ no one under this age because of various complications which arise in connection with the age and schooling certification of girls between the ages of 16 and 18. Of 25 women's clothing factories visited during the Survey only nine had any workers under 18. According to the report of the Industrial Commission of Ohio for 1914 only eight per cent of the workers employed in making men's clothing, and less than two per cent of the workers employed in making women's clothing were under 18 years of age.

Earnings

In general the wages paid in garment making compare favorably with those of other manufacturing industries. This is particularly true with respect to the earnings of women workers. A considerably larger proportion of the women employed in the garment industry earn what may be considered high wages for industrial workers than in any of the larger factory industries of the city. This is clearly shown

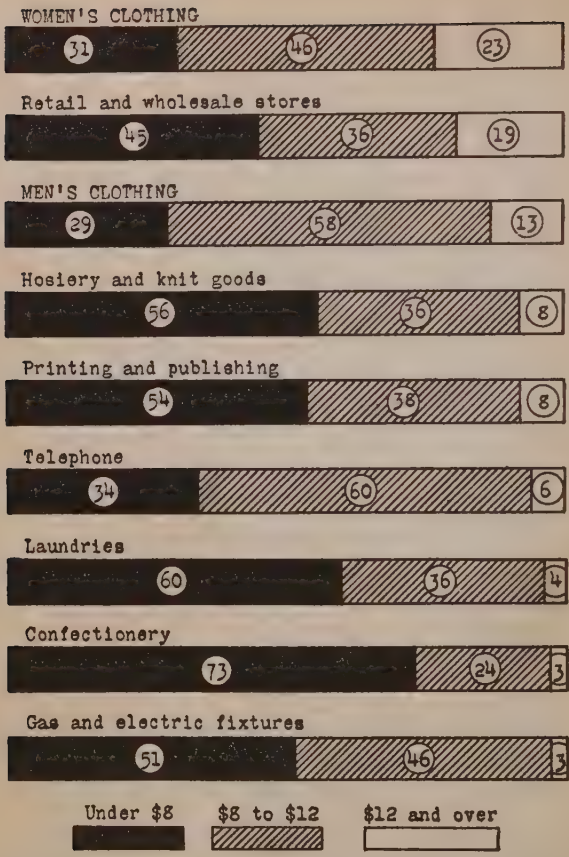

Diagram 8.—Percentage of women in men's and women's clothing and seven other important women employing industries receiving under $8, $8 to $12, and $12 and over per week

in Diagram 8 which lists nine of the principal fields of industrial employment for women. The proportions of women receiving under $8 a week are lower in men's and women's clothing than in the other seven industries. In the proportion of women receiving $12 and over, women's clothing ranks first and men's clothing third.

The comparison of the wages paid men employees shown in Diagram 9 is somewhat less favorable. Women's clothing ranks with printing and publishing as to the proportion of male workers receiving the highest specified earnings per week. Men's clothing ranks sixth among the industries compared.

The various kinds of work do not command fixed wage rates, as do many other types of industrial employment. Quantity of output as well as quality of workmanship is an important factor in the determination of wages. Men generally turn out a greater output than women on the same kind of work and piece workers usually earn more than those paid by the week. The lowest, average, and highest wages for each of the principal occupations in the two branches of the industry are shown in Tables 16 and 17.

One reason often given for the higher earnings received by workers on women's garments is the greater irregularity of employment in this branch of the industry. This, however, does not sufficiently account for the difference. The most weighty reason is that a higher degree of adaptability is required of workers than is the case in the manufacture of men's clothing.

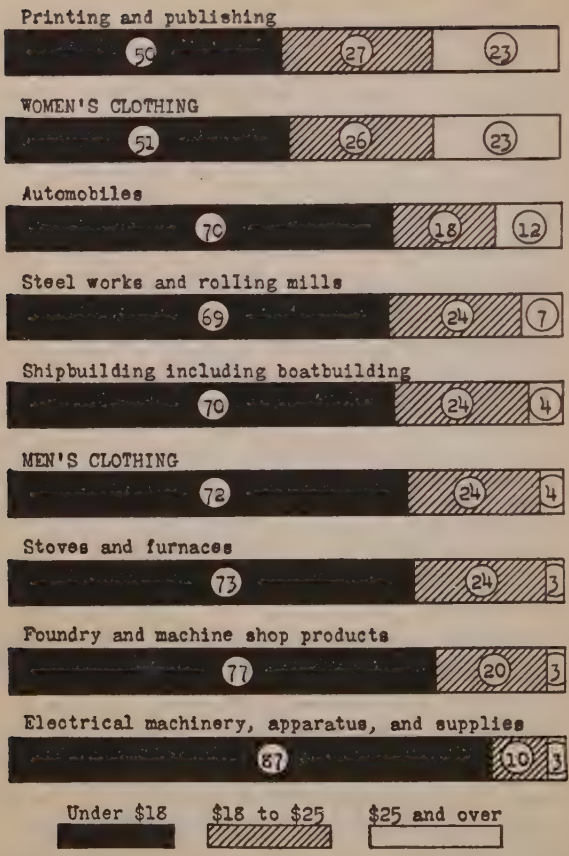

Diagram 9.—Percentage of men in men's and women's clothing and seven other manufacturing industries receiving under $18, $18 to $25, and $25 and over per week

TABLE 16.—WAGES FOR FULL-TIME WORKING WEEK, WOMEN'S CLOTHING, CLEVELAND, 1915

Workers	Lowest	Average	Highest
Assorters, women	$6.00	$8.75	$14.00
Hand sewers, women	6.00	10.00	20.00
Trimming girls	7.00	10.25	15.00
Operators,* women	6.00	12.00	30.00
Sample makers, women	10.00	12.75	15.00
Examiners, women	8.00	13.50	18.00
Models, suit and cloak	10.00	15.25	21.00
Forewomen	9.00	16.25	25.00
Operators,* men	7.00	17.75	50.00
Pressers, men	9.00	18.25	35.00
Cutters,† men	8.00	19.25	30.00
Pattern graders, suit and cloak, men	13.00	22.00	27.50
Sample makers, men	13.00	22.50	25.00
Examiners, men	16.00	25.00	45.00
Head tailors, men	18.00	25.00	..
Foremen	14.00	30.00	75.00

* Includes piece and section operators and helpers to head tailors
† Includes all cutters except foremen, apprentices, and pattern graders

TABLE 17.—AVERAGE WAGES FOR FULL-TIME WORKING WEEK FOR SIMILAR WORKERS, MEN'S AND WOMEN'S CLOTHING, CLEVELAND, 1915

Workers	Men's clothing	Women's clothing
Hand sewers, women	$9.50	$10.00
Section operators, women	9.25	11.25
Examiners, women	7.00	13.50
Section operators, men	16.50	15.25
Pressers, under	12.00	15.75
Forewomen	11.00	16.25
Pressers, upper	18.50	19.50
Cutters, cloth	18.75	20.00
Examiners, men	17.75	25.00
Foremen	29.25	30.00

Regularity of Employment

The making of women's clothing is seasonal, to meet a seasonal purchasing demand. Most people purchase their summer clothes in April and May, and

their winter clothes in October and November. During the months previous to these purchasing seasons a large number of workers are needed, but after the height of the purchasing period employment becomes less and less steady until the first demands of the new season are felt. During the rush season a greater number of workers is employed, or the output may be augmented by increasing the speed at which the work is performed or the number of hours in the working day. A combination of these methods is frequently used. During dull periods the workers may be busy from a few hours a week to full working time; while in rush periods they may work not only the regular working hours, but in addition a good deal of over-time.

Compared with other manufacturing industries as regards regularity of employment men's clothing makes an excellent showing while women's clothing ranks low. In Diagram 10 the average number of unemployed among each 100 workers is shown for men's and women's clothing and for 15 other large manufacturing industries in the city. Men's clothing leads the list, with an average unemployment of four among each 100 workers, while women's clothing ranks 14th, with 15 among each 100.

Training and Promotion

Designers learn their work through apprenticeships to custom tailors and cutters and by taking supplementary courses in drafting and grading of patterns

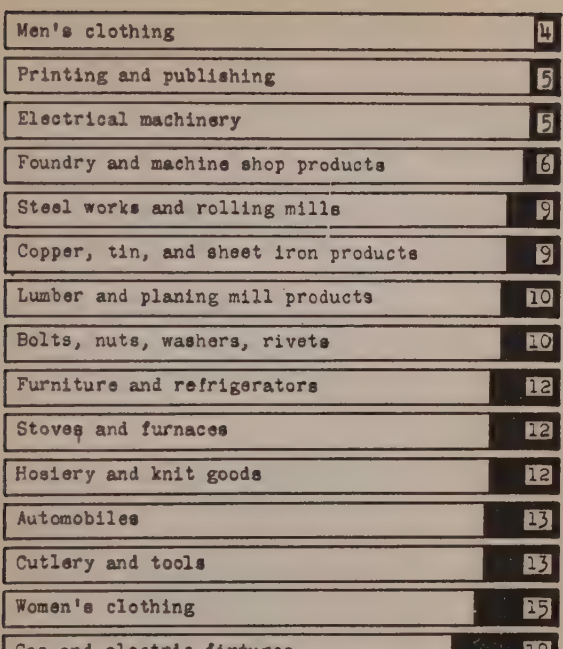

Diagram 10.—The black portions of the bars show the average number of unemployed among each 100 workers in men's clothing, women's clothing and 15 other specified industries

in a designing school. Most designers in Cleveland have had training in designing schools in New York or Chicago.

With but few exceptions organized training for

machine operating is found only in the largest establishments. There is general agreement among employers that it takes a girl who has never operated a machine before about four weeks to learn an easy operation well enough to be taken on at regular piece rates. A much longer time is required to become a first class worker on a single operation, and to acquire skill in a group of operations takes from one to two years.

Girls are not usually employed as hand sewers unless they know how to do plain sewing. A girl who starts with this knowledge should be able to learn factory sewing well enough to earn fair wages within from six months to a year.

In cutting, which has a so-called apprenticeship lasting from two to six years, there is no formal system of instruction. Boys must pick up the trade from observation and practice. Beginners start as errand boys, cloth boys, bundlers, or helpers.

Pressing is usually learned in cleaning and pressing shops. It takes about eight weeks for a green hand to become a good seam presser. To become a final presser on skirts and dresses requires from six months to a year, and on jackets and cloaks from two to three years.

Examiners have usually had considerable previous experience as machine operators or finishers. The length of experience depends on the kinds of garments and ranges from three to eight years.

Trimmers and assorters learn their work as helpers to experienced employees. A year or so of experience

is required before they can be entrusted with responsible work.

Foremen are selected from the working force or, in a few cases, trained especially for their positions. Although there are few opportunities each year for advancement to foremanship, employers declare they cannot get enough persons of ability to fill vacancies. A study of the previous experience of foremen and forewomen made by the survey shows that they come from nearly every department of the factory. The length of previous experience among the cases studied ranged from three months to nine years.

Educational Needs

The quality which proprietors of garment making establishments value above all others in their employees is adaptability. The reason for this is that the manufacturing of clothing differs from almost all other kinds of industrial work in the frequency with which changes take place in the size and shape of the product and in the range of materials which must be handled by the same workers. There is an annual change in the weight of cloth used for the different seasons, from light to heavy and from heavy to light. The size and shape of the pieces which compose the finished garment are determined by changes in style which vary from the minor modifications occurring yearly in men's clothing to the radical changes in the style of women's clothing. A wide variety of fabrics is employed, ranging from thick to thin, smooth to

rough, closely woven to loosely woven and from plain weave to fancy weave. In one season a single establishment will make garments from as many as 200 different fabrics, and each operator is likely to work upon 60 or more different kinds of cloth.

In view of the fact that many of the workers are foreigners or of foreign parentage, and that the frequent changes in styles and materials require the giving of detailed instructions by foremen, instruction in English is of more importance in the garment trades than in occupations where there is a larger proportion of native born and where the products and processes are more uniformly standardized.

All clothing workers should have a practical knowledge of the fundamental operations of arithmetic. Where the piece and section systems are in operation it is important for the worker to keep account of what she has accomplished and to know enough arithmetic to check her own record with the tally kept by the foreman or payroll girl. Some of the occupations, such as cutting, involve a considerable amount of arithmetical computation.

As in other trades, all workers and prospective workers need a general knowledge of industrial conditions. They would greatly benefit from a better understanding of the supply of labor, factors affecting prices, organization of workers, industrial legislation, the relative importance of the field of employment in different industries, the nature of important industrial processes, and the like. At the present time there is little opportunity for gaining such in-

formation either before entering any specific line of work or afterwards.

For certain small groups within the clothing industry there are needs in the way of technical training that are important and at present unsupplied. Training in applied mathematics, drafting and design would be of benefit to a considerable number of employees who are occupying or working towards advanced positions.

A large proportion of the women workers need skill in hand sewing. Before girls enter the industry they should have careful and systematic training in plain sewing stitches, sewing on buttons and other fasteners, and button hole making.

Machine operating is the most important occupation in the industry, and employs more women than any other occupation in the city, except perhaps dressmaking. After a careful study of the characteristics of this occupation and the various conditions affecting it, the survey reached the conclusion that there should be established by the school system a trade course for prospective power machine operators.

Sewing Courses in the Public Schools

In the elementary schools manual training sewing is given in the fifth and sixth grades. It consists of one hour a week of hand sewing taught by a regular grade teacher or sometimes by teachers of domestic science or other special subjects. The aim is to give

the girls a knowledge of practical sewing which may be of use to them in the home. In five of the elementary schools hand and machine sewing is taught by special sewing teachers. About four per cent of all the seventh and eighth grade girls in the elementary schools receive this instruction. In the technical high schools the sewing course covers four years work. During the first two years all girls are required to take plain hand and machine sewing three and three-quarter hours a week. In the third and fourth years they may elect either millinery or dressmaking, and special courses in these subjects are provided for girls who wish to prepare for trade work. The aim of the sewing course as stated in the outline of the East Technical High School is "(1) Preparation for efficiency in the selection of the materials used in sewing and the construction of articles relating to the home and family sewing: (2) laying the foundation for courses in college, normal school, or business school." A two year elective course in sewing is provided in the academic high school as a part of the home economic course. The aim of this sewing, which is called domestic art, is stated thus: "Problem—my personal appearance is one of my chief assets. What can I do to improve it?" Dressmaking and millinery classes are conducted in the night technical high schools to teach girls how to make their own clothes and hats.

The manual training sewing in the fifth and sixth grades cannot be considered as furnishing any important contribution in the training of those who will

make their living in the sewing trades. Much the same must be said of the work in the technical high schools. It is taught not for the purpose of securing quick, accurate hand or machine stitching, but to enable the girls to make a few garments for their personal use. Due to the fact that very few of the girls who become wage earners in these trades remain in school after the completion of the elementary course it is doubtful whether the technical high school offers a hopeful field for practical training. The work in the elementary schools is so hampered by lack of equipment that the results, from the standpoint of trade preparation, amount to very little.

Elective Sewing Courses in the Junior High School

The reduction of retardation all through the grades is of fundamental importance to any plan of vocational training. The age of 15 is the final compulsory attendance age for girls, and those who enter at six and seven and make regular progress should be in the first or second high school year by the time they reach this age. Last year there were, however, 1,170 fifteen-year-old girls in the Cleveland schools who were from one to seven grades below normal. Instead of being in the high school, they were scattered from the second grade to the eighth, and they constituted more than half of all the girls of that age in the school system. It is clear that unless the schools can carry them through more nearly on schedule

time there is no hope of providing industrial training for a large proportion of them, because they reach the end of the compulsory period before entering the grades in which industrial training can be given effectively and economically.

The report recommends that during the junior high school period girls who expect to enter the sewing trades should be given work in mechanical drawing, elementary science, industrial conditions, elementary mechanics and hand and machine sewing. The fundamentals of sewing can be thoroughly taught in two years. The work during the first year might well be limited to hand sewing. Machine sewing should be taken up in the second year, and the girls given an opportunity during the third year to specialize somewhat broadly in a trade school on the kind of work in which they may wish to engage —power operating, dressmaking, or millinery.

A One Year Trade Course for Girls

Specialized training must be conducted under conditions closely resembling those found in the industry. This involves equipment similar to that used in the factory, an ample supply of materials, and a corps of teachers who have had practical experience. It might seem that on the score of adequate equipment the factory itself would be the place for such training. But the fact is that the main object of the factory is to turn out as large a quantity as possible

of saleable product. In the school the main object should be to turn out as large a quantity of saleable skill and knowledge as possible, with the saleable product as a secondary, although necessary, feature.

The junior high school is not the place for specialized trade training, since it is reasonably certain that there would not be a sufficient number of girls in each junior high school desiring to enter a single trade to warrant the provision of special equipment and special teachers. For this reason the report favors a trade course in a separate school plant where girls who wish to specialize in any of the sewing trades can be taught in fairly large classes. The work done during the past few years in such institutions as the Boston Trade School for Girls and the Manhattan Trade School for Girls in New York City gives evidence of the practicability of this plan.

Trade-Extension Training

The only instruction offered by the public school system at the present time which can be considered as trade-extension training for the garment industries is that given in the sewing classes in the technical night schools. The enrollment in these classes during the second term of 1915–16 was 229. Only a small proportion of the girls and women enrolled in the night sewing classes make their living by sewing. The students employed by day in clothing factories or in any of the sewing trades constitute somewhat less than 15 per cent of the total number enrolled.

Nearly half of the enrollment is made up of workers in commercial, clerical or professional pursuits and approximately one-third are not employed in any gainful occupation.

In both technical night schools the emphasis is laid on training for home sewing rather than on training for wage earning. The courses now given are not planned for workers in the garment trades, but to help women and girls who want to learn how to make, alter, and repair their own garments.

If a trade school of the kind described in the previous section were established it would be possible to give at night short unit courses in machine or hand sewing to those workers who wish to extend their experience and prepare themselves for advancement, utilizing in the night classes the equipment of the day school. It is probable also that special day classes could be organized during the dull season to give beginners the opportunity to learn new processes and extend their knowledge of trade theory.

CHAPTER XV

SUMMARY OF REPORT ON DRESSMAKING AND MILLINERY

At the time of the last census the total number of women in Cleveland employed as milliners or dressmakers was approximately 5,000, of whom about seven-tenths were dressmakers and about three-tenths milliners. For the most part they were of native birth. The proportion of young girls engaged in these occupations was relatively small, the age distribution showing that only about one-third of the milliners and less than one-fifth of the dressmakers were under 21 years of age.

Dressmaking

Four distinctive lines of work are done by those who are classified by the census as dressmakers and seamstresses: dressmaking proper, usually carried on in shops; alteration work in stores; general sewing done by seamstresses at home or in the homes of customers; and the work of the so-called dressmaking "school," in which the dressmaker helps her customers do their general sewing.

Shop dressmaking is in the main confined to the

making of afternoon and evening gowns and fancy blouses. Nearly uniform processes of work are maintained and the workers in the different establishments need about the same kinds of abilities and degrees of skill. There is a strong and increasing tendency towards specialization of the work.

Among each 100 workers in dressmaking shops about 13 are head girls, 55 are finishers or makers, 16 are helpers, eight are apprentices, and the rest are lining makers, cutters, embroiderers, errand girls, shoppers, and stock girls.

Alteration work constitutes a separate sewing trade and consists of the adjustment of ready-made garments to individual peculiarities. It furnishes employment to several hundred workers in Cleveland.

The weekly wages most commonly paid to each class of workers in dressmaking shops may be roughly stated as follows: apprentices, $2 to $4; helpers $6 to $9; finishers or makers $10 to $12; and drapers $18 to $20. Lining making, done in most shops by apprentices or helpers, pays from $4 to $6 a week. In one shop a specialist on linings received $12. Women cutters, found in two shops, and doing supervisory work similar to that done by drapers, earned from $15 to $25. Hemstitchers earn $10 to $14 and a guimpe maker in one shop earned $12. Errand girls were found at $3 and $6; stock girls at $8, $12, and $13; and shoppers at from $3.50 to $10.

Beginners in alteration departments are started at from $5 to $7. Regular alteration hands earn from

$7 to $18, the average being $9 or $10. Fitters earn about the same as drapers in dressmaking shops, averaging from $15 to $18, with a range of from $10 to $25.

As a rule comparatively little time is lost through irregularity of employment. Workers average from 10 to 11 months' work out of the year. Establishments usually close during the month of August and for one or two weeks in the spring. Workers in alteration department average 11 months of work. Dress alteration work is steady, while suit and coat alteration is irregular.

Apprenticeship in dressmaking comprehends a trying-out period of from six months to a year. Most shops take apprentices, the proportion in the trade being one to every 12 workers; and an effort is made to keep these new workers if they are at all satisfactory. There is no standardized apprenticeship wage. Girls may serve without pay for six months, or may start at from 50 cents to $4 a week. At the end of six months they may be earning from $1.50 to $6. The lack of any wage standard in apprenticeship probably accounts for the fact that it is difficult to get girls to enter this trade.

Millinery

Millinery requires the handling of small pieces of the most varied sorts of material, most of it perishable. The materials must be measured, cut, turned, twisted, and draped into innumerable designs and

color combinations, and sewed with various kinds of stitching. The main processes are making, trimming, and designing. Making consists in fashioning a specified shape from wire or buckram and covering it with such materials as straw or velvet. The covering may be put on plain, or may be shirred or draped. Trimming consists in placing and sewing on all sorts of decorative materials. A combination of the two processes of making and trimming, known as copying, consists in making a hat from the beginning exactly like a specified model. Designing is the creation of original models.

The increase in the use of the factory-made hat has decreased the number of workers in custom millinery, and has also had an effect in diverting business from small retail shops to millinery departments in stores. The number of millinery workers constantly fluctuates, not only from season to season, but from year to year. According to a close estimate not more than 2,000 workers were actually engaged in millinery occupations during the busiest part of 1915. Between 1,200 and 1,400 were in retail shops; about 300 were in millinery departments in stores; and about 300 more were in wholesale houses.

The data collected indicate that the wages of workers in retail shops are lower in general than the wages of workers in millinery departments in stores and in wholesale houses. Makers in retail shops earn from $3 to $16 a week, the average being about $8. Trimmers earn from $10 to $40, with an average of

about $18. Out of 45 retail shops, only 22 paid as high as $10 to any maker; 15 paid as high as $12; six paid as high as $15; and only one paid over $15.

In millinery departments in stores, trimmers, who are generally designers, earn from $15 to $50 a week or more. The rate most commonly received is $25. Makers are started at from $4 to $6 and may advance to $15, with an average of about $10.

In wholesale houses designers earn from $25 to $60, or more. Makers start at about $5, and the usual range is from $10 to $15. Those employed in straight copying may earn between $15 and $20. The 1914 report of the Industrial Commission of Ohio presents data showing that of the women 18 years of age and over employed in wholesale houses 37 per cent receive under $8, about 22 per cent receive between $8 and $12, while 41 per cent receive $12 and over. The girls under 18 years of age were, with one exception, receiving less than $4 per week.

Employment in retail shops averages about 32 weeks during the year; in the millinery departments of stores from 32 to 42 weeks; and in wholesale houses about 40 weeks. The proportion of workers employed the year round is very small. The majority of millinery workers are faced with the problem of tiding themselves over two dull seasons, aggregating from 12 to 28 weeks each year.

The millinery apprenticeship period lasts for two seasons of 12 weeks each. Almost all retail shops take apprentices in large numbers, there being one apprentice to every three or four workers in the trade.

Few apprentices are found in stores and wholesale houses. The apprenticeship wage is extremely low. The usual rate is $1 a week during the first season and from $1.50 to $2 during the second.

The Problem of Training

The needs of girls who are soon to leave school and go to work can best be met by a modification of the junior high school course and by the establishment of a one-year trade school for girls. Before a reorganization of the junior high school work is made to meet the needs of these girls an effort should be made to reduce retardation so that more girls will reach the junior high school before the end of the compulsory attendance period. The present courses should be reorganized so as to give basic preparation for wage earning and should be as concrete and real as a thorough understanding of the requirements of the gainful occupations can make them. Thorough sewing courses planned from the standpoint of the sewing trades should be offered, extending over two years. The program suggested closely resembles that recommended for the garment trades.

It is also recommended that a one-year trade school be established for preparing girls to enter employment in dressmaking and millinery. The history of trade schools for girls, both private and public, indicates that such a school, if properly conducted, would be highly successful in Cleveland.

The classes in sewing and millinery in the evening

technical high schools do not offer trade-extension training for workers and it is not likely that they could be easily reorganized to furnish such training. It is recommended that if a trade school is established in Cleveland, short unit courses in sewing and related subjects, such as design, be given in evening classes.

CHAPTER XVI

SUMMARY OF REPORT ON THE METAL TRADES

Approximately one-half of the total number of persons in Cleveland engaged in manufacturing are found in the metal industries. When the last federal census was taken nearly one-seventh of the entire male population was employed in establishments engaged in the manufacture of crude or finished metal products. Pittsburgh only, among the 10 largest cities in the country, has a higher proportion of its industrial population working in such establishments. In relation to its total population, Cleveland has twice as many people working in these industries as Chicago, three times as many as Philadelphia, and four times as many as New York. It is estimated that at the present time the number of wage earners in the city engaged in this kind of work is between 70,000 and 80,000.

The report deals with the three leading industries of the city,—foundry and machine shop products, automobile manufacturing, and steel works and rolling mills. The study of this last group also includes several related industries, such as blast furnaces, wire mills, nail mills, and bolt, nut, and rivet fac-

tories. About three-fourths of the total number of wage earners in the city engaged in the manufacture of metal products are found in these three industries.

The field investigations consisted of personal visits to the manufacturing establishments for the purpose of securing first hand data as to industrial conditions, and conferences with employers, superintendents, foremen, and workmen as to the need and possibilities of training for metal working occupations. In all, 60 establishments, employing approximately 35,000 men, were visited. The conclusions as to vocational training were based on an analysis of educational needs in the various metal industries, together with an extended study of the social and economic factors which condition the training of all workers. Particular attention was given to the administrative problems involved in such training in public schools.

Foundry and Machine Shop Products

According to the United States Census, foundries and factories making machine shop products gave employment in 1909 to nearly 18,000 Cleveland wage-earners. This industrial group ranks first in the city, employing more than twice as many workers as the next largest industry,—automobile manufacturing,—and approximately two-fifths of the total working force in all metal industries. Its growth during the previous five years, from the standpoint of number of workers employed, showed

an increase of about 33 per cent, and it is estimated that the total number of wage-earners in 1914 was approximately 25,000. At the present time, due to the impetus given to this branch of manufacturing by the European war, the working force is undoubtedly in excess of this figure.

The report gives extended consideration to the machinist's trade, which constitutes by far the largest body of skilled workers in the city. This trade has been affected more than any other by the progress of invention and the modern tendency towards specialization. In many establishments the all-round machinist, competent to do independent work and operate the wide variety of machine tools now used in the trade, had practically disappeared. In his place are found "specialist" machine hands who have learned the operation of a single machine tool, but have no general knowledge of the trade, and who if called on to perform work requiring the use of a machine tool different from the one on which they are employed are unable to do so. There are hundreds of drill press hands who cannot operate a milling machine, lathe hands who know nothing of planer work, and so on. The subdivision of these occupations follows closely the advance in invention, so that employers advertising for help frequently specify not only the machine tool to be used but add the name of the firm which manufactures that particular type of machine, with the result that there are about as many kinds of machinists as there are manufacturers of machine tools. Table 18 shows the esti-

mated number of men employed, with their distribution in the various branches of the trade.

TABLE 18.—PROPORTIONS AND ESTIMATED NUMBERS EMPLOYED IN MACHINE TOOL OCCUPATIONS, 1915

Workers	Per cent	Estimated number
Lathe hands	18.8	3,384
Drill press operators	17.9	3,222
Bench hands	13.4	2,412
Machinists	12.7	2,286
Screw machine operators	9.4	1,692
Milling machine operators	8.6	1,548
Tool makers	8.3	1,494
Grinding machine operators	6.2	1,116
Planer hands	2.2	396
Turret lathe operators	1.8	324
Gear cutter operators	.7	126
Total	100.0	18,000

Specialization has operated to lower standards of skill and keep down wages. The average wage of the "all-round" machinist is very nearly the lowest found among the skilled trades The union scale is but 14 cents an hour above that paid unskilled labor, while the average earnings of machine operators range from four to 12 cents above laborers' wages. Only among the highly skilled tool makers do the wages approach those received by skilled labor in most other industries. Table 19 shows the average, highest, and lowest rates per hour for all branches of the machine trades in the establishments from which data were collected during the survey, with the per cent employed on piece work and day work.

TABLE 19.—AVERAGE, HIGHEST, AND LOWEST EARNINGS, IN CENTS PER HOUR, AND PER CENT EMPLOYED ON PIECE WORK AND DAY WORK, 1915

Workers	Lowest	Average	Highest	Per cent on piece work	Per cent on day work
Tool makers	25.0	39.0	50.0	..	100
Machinists	25.0	33.2	50.0	..	100
Planer hands	20.0	32.2	42.0	..	100
Grinding machine operators	20.0	32.0	50.0	70	30
Bench hands	17.5	29.3	45.0	48	52
Screw machine operators	17.5	29.5	63.8	79	21
Lathe hands	19.0	29.1	40.0	40	60
Turret lathe operators	25.0	29.0	47.5	80	20
Gear cutter operators	20.0	26.7	40.0	96	4
Milling machine operators	15.0	25.9	40.0	53	47
Drill press operators	15.0	23.5	35.0	35	65
Machinists' helpers	20.0	22.2	25.0	..	100

On the basis of weekly or yearly earnings, the trade makes a better showing. Work is steady throughout the year, and the time lost through unemployment on account of seasonal changes is slight. Also, as the usual working day is from nine to 10 hours, that is, from one to two hours longer than in the higher paid building trades, the difference in daily wages is really less marked than a comparison of hourly rates would seem to indicate.

Little attempt has been made to adapt the apprentice system to modern conditions. The term of service and rates of pay have changed but slightly over a long period of years. As a result only a small proportion of the boys who begin as apprentices finish the apprenticeship term of three or four years. Employers attribute this to the relatively high wages paid for machine operating, and the slight advantage,

from a wage standpoint, of the "all-round" man over the machine operator. After a year or two the apprentice finds that he can double his pay by taking a job as operator, and the inducement for learning the trade thoroughly is too small to hold him. The report gives a comparison of the earnings of an apprentice and a machine operator, both starting at the same age, the first becoming a journeyman machinist at the end of three years and the second specializing on a particular machine. Assuming that both boys go to work at the age of 16 their total earnings up to the age of 25 years will be approximately equal. The lack of thoroughly trained workmen is beginning to be felt, but the efforts made by industrial establishments to meet it have small prospects of success unless the economic factors of the problem are given greater consideration.

Inasmuch as no regular apprenticeship period is served for machine operating, a special effort was made to secure data relating to the time usually required for the worker to learn the operation of each tool well enough to earn average wages. In this matter the individual opinions of foremen and superintendents differed widely, but when the reports from all the establishments visited were compared, a sufficient degree of uniformity was found to serve as a basis for estimating the amount of experience workers of average intelligence would need, under normal shop conditions, in order to become fairly proficient.

There was practical unanimity in fixing the period

at four years for tool makers and three to four years for machinists. Higher estimates were received from the superintendents of plants doing a jobbing business or manufacturing high grade machine tools than from the specialized shops making a single product. The superintendents of automobile manufacturing plants, where the standard of quality in production is necessarily high, gave the lowest estimates of all. Table 20 shows the estimated time required to learn the various types of machine work.

TABLE 20.—ESTIMATED TIME REQUIRED TO LEARN MACHINE TOOL WORK

Workers	Time required
Grinding machine operators	12 to 15 months
Lathe hands	6 to 9 months
Planer hands	6 months
Gear cutter operators	6 months
Turret lathe operators	4 to 6 months
Screw machine operators	3 to 6 months
Bench hands	3 to 6 months
Milling machine operators	2 to 4 months
Drilling machine operators	2 weeks to 4 months

The weakness of specialization, with its constant tendency towards the substitution of semi-skilled operatives for trained workmen, lies in its failure to provide a body of workers from whom to recruit the large directive force needed in any scheme of production based on semi-skilled labor. This condition is regarded by many employers with grave concern, and in a few plants apprentice schools designed primarily to train future foremen have been established.

Practically all the foremen in the shops visited had received an all-round training as machinists, and there are few opportunities for promotion open to men who have not a general knowledge of the trade. On the other hand, such general knowledge is only one of the requisites for advancement. Others are initiative, resourcefulness, tact, self-control, ability to get along with men, and a disposition to subordinate personal interests to the interests of the business. To these should be added the quality of patience, for there must be vacancies before there can be promotions, and vacancies among the better positions are not frequent. Ten of the establishments visited, employing a total working force of over 5,000 men, reported but eight vacancies among foremen's positions over a period of one year. These same establishments had in their employ a total of 618 all-round machinists and tool makers. Assuming that only the machinists and tool makers were eligible for promotion, the mathematical chance per man of becoming a foreman during the year was about one in 77.

Other occupations studied in detail were pattern making, molding, core making, blacksmithing, and boiler making. Pattern making offers the most interesting work and the highest wages among the metal trades, but the total number of American born pattern makers in the city does not exceed seven or eight hundred, so the field of employment is relatively limited. Molding and core making, in which between 4,000 and 5,000 men are engaged, have

practically become foreign trades. Less than 20 per cent of the molders in the city were born in this country. These trades offer few opportunities for employment to boys of native birth. Somewhat similar conditions exist in the blacksmithing trade. Changed methods of production have largely done away with the old-time blacksmith, who survives only in horse-shoeing and repair shops. The proportion of native blacksmiths is steadily declining, and it is unlikely that any considerable number of boys from the public schools will enter the trade. The boiler making trade employs relatively few men, the total number of native born boiler makers at the time of the last census being less than 600. The trade seems to be at a standstill. The increase during the previous decade was less than five per cent against a total population increase of 46 per cent. The average earnings per hour for these trades in the establishments visited by members of the Survey Staff are shown in Table 21.

TABLE 21.—AVERAGE EARNINGS PER HOUR IN PATTERN MAKING, MOLDING, CORE MAKING, BLACKSMITHING, AND BOILER MAKING

Workers	Average earnings Per Hour
Pattern makers	.44
Skilled molders	.39
Semi-skilled molders	.27
Skilled core makers	.39
Semi-skilled core makers	.27
Blacksmiths	.33
Boiler makers	.32

The findings and recommendations as to training emphasize the fact that the vast majority of boys

who become workers in the metal trades leave school by the time they are 15 with at most a common school education, so that any vocational training before they go to work must be given between the ages of 12 and 15 and before the end of the eighth grade. The report points out the impossibility of effective vocational instruction in elementary schools on account of the prohibitive cost per pupil for both equipment and teaching, and endorses the recently adopted junior high school plan. This form of organization has the great advantage of concentrating in large groups the boys who are old enough to make a beginning in prevocational training, and through the departmental system of teaching offers facilities for differentiation of courses to meet their varying needs.

Whatever their cultural value, the present manual training courses in woodwork have little relation to the requirements of any metal working trade, except pattern making, in which some of the same tools are used. No manual training work in metal is offered in the elementary and junior high schools.

The course recommended for the junior high school lays especial emphasis on applied mathematics, mechanical drawings, practice in assembling and taking apart machines, and the utilization of the shop as a laboratory for teaching industrial science. The report maintains that the object of such a course should be the development of industrial intelligence through the application of mathematical and mechanical principles to the solution of concrete problems, rather than the teaching of specific operations and skill in

the use of tools. In mechanical drawing the ability to understand and interpret drawings should be given more importance than the ability to make drawings. Few workmen are ever called on to draw, while the ability to read plans and sketches is always in demand. It is also recommended that boys who do not expect to take a full high school course or who intend to leave at the end of the compulsory period should devote at least a period each week to the study of economic and working conditions in industrial and commercial occupations.

With respect to the technical high schools the report holds that these schools are primarily training schools for the higher positions of industry. They undoubtedly offer the best instruction obtainable in the city for the ambitious boy who wishes to prepare himself for supervisory and managerial positions in industry or for a college engineering course.

The establishment of a separate two-year vocational school, equipped for giving instruction in all the larger industrial trades, is recommended. The number of boys in the public schools between the ages of 14 and 16 who are likely to enter the metal trades is between 700 and 800, of whom from 500 to 600 will become machinists or machine tool operators. An enrollment of much less than this number is sufficient to justify the installation of good shop equipment and the employment of a corps of teachers who have had the special training necessary for this kind of work. It should be possible to form a class in pattern making and foundry work of from 80 to 100 boys, and one

of at least 30 in blacksmithing. Boiler making could be taught in connection with sheet metal work.

Various changes are recommended in the present evening school classes for machinists, molders, and pattern makers now given by the technical high schools. It is claimed that the courses as now organized are not elastic enough to meet the varying needs of the journeymen, helpers, machine operators, and apprentices employed in these trades. The great need is for short unit courses in which the instruction is limited to a particular machine or a special branch of the trade. The long course tends to discourage the student, especially when it embraces an amount of theory out of all proportion to his working needs.

Automobile Manufacturing

Due to the large number and specialized character of the occupations in this industry, they are taken up in a more general way than the "foundries and machine shop" group. The productive departments of the automobile factories utilize in the main the same equipment as other machinery manufacturing plants, but specialization has been carried to a degree found in few other metal industries. The "all-round" workman is a rara avis. The machine shops are manned by machine "specialists" most of whom know how to operate a single machine tool or perform a single operation made up of relatively simple elements. From one-half to two-thirds of the work-

ing force is recruited from immigrant labor which is "broken in" under skilful foremen within a period varying from a few days to a few weeks. In the simpler assembling operations the jobs are so subdivided that any man who is not actually feebleminded can learn the work in a few days. Production is on a large scale, permitting the maintenance of high-grade engineering and experimental departments, where all of the work is planned to the last detail. As a result the automobile manufacturers are turning out one of the most complicated and most efficient machines known to modern industry with a working force composed chiefly of semi-skilled labor.

For the machine shop workers the training suggested is similar to that recommended for the same class of workmen in other machine shops. The necessity of short unit courses adapted for teaching parts of the trade rather than the whole trade is obvious, as most automobile workers are employed on specialized operations. Short unit evening courses for motor and transmission assemblers, and testers and inspectors, are recommended.

Steel Works, Rolling Mills, and Related Industries

A somewhat similar treatment is followed with respect to the iron and steel group of industries—blast furnaces, steel mills, rolling mills, wire mills, nail mills, and bolt, nut, and rivet factories. These industries are characterized by a high proportion of

common and semi-skilled labor in the working force. Between 75 and 90 per cent of the workers are of foreign birth. In the operating department of one mill only two Americans were found among a total of 600 employees. As a rule the native born workers are mechanics employed in the power and maintenance departments.

With scarcely an exception the occupations are of a nature that require the worker to learn through actual experience in the mills. Theory and practice must be learned at the same time. Even the supervisory and executive positions in which a technical education is of considerable value require a long and arduous apprenticeship on the job before the worker can compete with men who have started with the scantiest educational equipment, but have picked up a knowledge of the processes by experience and observation. Below these positions the work rapidly grades off to various kinds of machine operating in which not even the ability to read or understand English is required.

No plan of vocational training is presented, because at present the mills recruit almost exclusively from foreign labor, and only a very small number of boys from the public schools are likely to seek employment in them. The technical content of the work which might conceivably be given in evening classes, except in the case of the few directive and supervisory positions, is so small that continuation instruction offers but meager hopes of success. Under present conditions the long working day and the

necessity of changing from the day to the night shift, or vice-versa every two weeks, constitutes an insuperable obstacle to the organization of night classes.

The principal need of the rank and file is a speaking and reading knowledge of the English language, so that the workers can be taught to avoid and prevent accidents, and give themselves the necessary care when they occur. Instruction in English with possibly courses in accident prevention and personal hygiene represent about the only training possible that can be said to have any real vocational significance.

CHAPTER XVII

SUMMARY OF REPORT ON THE BUILDING TRADES

A careful estimate places the number of men engaged in building construction in Cleveland at the present time at about 30,000, comprising more than one-fifth of the total number employed in manufacturing and mechanical occupations. About two-thirds of these workmen are skilled artisans, distributed among some 20 different trades. The estimated number in each trade is shown in Table 22.

Sources of Labor Supply

The building trades get their workers from four principal sources: immigration, native journeymen from outside the city, helpers, and apprentices. Immigration contributes the largest proportion in both skilled and unskilled work, practically monopolizing the latter. Over four-fifths of all cabinet makers, more than two-thirds of all brick and stone masons, and nearly two-thirds of all carpenters are foreign born. Plumbers and steam-fitters show the smallest proportion of foreign labor.

TABLE 22.—ESTIMATED NUMBER OF MEN ENGAGED IN BUILDING TRADES, 1915

Workers in trade	Number employed
Carpenters	7,105
Painters, glaziers, varnishers	2,746
Plumbers, gas- and steam-fitters	2,014
Bricklayers	1,800
Machine woodworkers	1,198
Sheet metal workers or tinsmiths	1,069
Cabinet-makers	895
Inside wiremen and fixture hangers	750
Plasterers	638
Paperhangers	379
Structural iron workers	356
Roofers and slaters	315
Stone-cutters	292
Lathers	275
Stone masons and marble setters	250
Ornamental iron workers	200
Cement finishers	200
Hoisting engineers	150
Elevator constructors	100
Parquet floor layers	100
Tile-layers	100
Asbestos workers	75
Wood carvers	63
Helpers	926
Apprentices	306
Total	22,302

Apprenticeship

The general decline of the apprenticeship system which began with the invention of modern labor-saving machinery has affected the building trades least of all. Here it survives in an active state and is steadily gaining ground. It is in favor with many employers and with all unions. The best apprenticeship systems are found in the strongly organized trades.

It is true that in some of the trades apprenticeship is little more than a name, meaning simply that per-

mission has been granted to learn the trade. The apprentice is left free to pick up what experience he can between the odd jobs that are given him. What meager instruction he receives comes from a journeyman worker who is none too eager to give up what he considers the secrets of his trade.

The union regulations provide that boys shall not enter the trades as apprentices or helpers below the age of 16. The limits set by the various trades and the union regulations as to length of apprenticeship are shown in Tables 23 and 24.

TABLE 23.—UNION REGULATIONS AS TO ENTERING AGE OF APPRENTICES

Asbestos workers	Enter at any age
Bricklayers	Between 16 and 23
Carpenters	Between 17 and 22
Cement finishers	Must be full grown
Elevator constructors	Must be full grown
Lathers	Must be 18 years old
Inside wiremen	Between 16 and 21
Painters and paperhangers	Before 21 years old
Plumbers and gas-fitters	Must be 16 years old
Sheet metal workers	Must be over 16 years
Slate and tile roofers	Must enter before 25
Steam-fitters	Must be full grown
Structural and ornamental iron workers	Between 18 and 25

TABLE 24.—UNION REGULATIONS AS TO LENGTH OF APPRENTICESHIP PERIOD

Trades in which indentures are usually signed	
Bricklayers	4 years
Plasterers	4 years
Sheet metal workers	4 years
Trades in which indentures are seldom signed	
Steam-fitters	5 years
Carpenters	4 years
Inside wiremen	4 years
Plumbers and gas-fitters	4 years
Cement finishers	3 years
Asbestos workers	3 years
Painters and paperhangers	3 years
Slate and tile roofers	3 years
Lathers	2 years
Structural and ornamental iron workers	1½ years
Elevator constructors	varies

All obtainable information points to the conclusion that the number of apprentices employed in the city is far below the maximum permitted by the unions. Many large contractors have no apprentices and say they will not bother with them. Others state that they have been unable to get or keep good apprentices and have therefore given up the plan.

Union Organization

The building trades are among the most strongly organized in the city. It is estimated that their unions at the present time include about 90 per cent of all the men engaged in building work. Practically all the large contracting firms employ only union labor. The few non-union workers are employed by small contractors.

Requirements for admission to the different unions vary to a marked degree. If the union is strong and has a good control over the labor supply, admission fees are higher and regulations as to apprentices and helpers are more stringent than if the union is fighting to gain a foothold.

Earnings

No industrial workers in the city are paid better wages than those employed in the building trades. More than one-half of the skilled workers are in trades that pay an hourly wage of 50 cents or over. The hourly rate in each occupation is shown in Table 25.

TABLE 25.—UNION SCALE OF WAGES IN CENTS PER HOUR MAY 1, 1915

70 Cents

Bricklayers	70.00
Hoisting engineers on boom derricks, etc.	70.00
Stone masons	70.00
Structural iron workers	70.00

From 60 to 70 Cents

Marble setters	68.75
Inside wiremen	68.75
Plasterers	68.75
Slate and tile roofers	67.50
Parquet floor layers (carpenters)	62.50
Lathers, first class	62.50
Plumbers	62.50
Steam-fitters	62.50
Stone-cutters	62.50
Hoisting engineers, brick hoists	60.00
Elevator constructors	60.00

From 50 to 60 Cents

Tile layers	59.38
Lathers, second class	56.25
Carpenters	55.00
Cement workers, finishers	55.00
Sheet metal workers	50.00
Painters	50.00
Paperhangers	50.00

From 40 to 50 Cents

Asbestos workers	47.50
Composition roofers	42.50

Under 40 Cents

Cabinet-makers and bench hands	37.50
Machine woodworkers	37.50
Electrical fixture hangers	37.50
Hod-carriers	35.00

Union organization is a more powerful factor in determining wages in these trades than technical knowledge and skill. A high degree of skill in a given trade brings little advantage in the matter of wages. By establishing a minimum scale below which no jour-

neyman shall work, the union secures practically a flat rate of pay for most of the men in the trade. When there is much building work and good men are scarce, contractors sometimes pay higher wages to highly skilled workmen in order to secure their services. As a rule, however, their reward comes in the form of steadier employment. The less skilled man is the first to be laid off when business is slack, while the first-class workman, for the reason that he is so hard to replace, is the last to be discharged.

Many unions, among them those of the carpenters, bricklayers, and painters, make no provision as to the wages of apprentices. Table 26 shows the wages in three of the building trades that have established a uniform scale for apprentices. Sheet metal apprentices are paid a bonus of $1 extra for each week served.

TABLE 26.—USUAL WEEKLY WAGES OF APPRENTICES IN THREE BUILDING TRADES

Year	Inside wiremen	Plasterers	Sheet metal workers
First year	$5.50	$5.50 to $6.25	$5.00
Second year	13.20	8.25 to 11.02	5.50 to 6.00
Third year	17.60	13.75 to 16.00	6.50 to 7.00
Fourth year	22.00	19.25	8.00 to 9.00

Hours

The usual working day is eight hours. Many of the trades work only a half day on Saturdays throughout the year; practically all have this half holiday during

the four summer months. For holiday or over-time work the men receive either pay and a half or double pay.

Regularity of Employment

Due to the seasonal character of building work, it is next to impossible for a building contractor to keep a large force employed all the year. One result of this situation is that the men change employers more than any other workers in industry. Irregularity of employment is greater in building construction than in any other of the principal industries of the city. A comparison between the different branches of building work as to regularity of employment is presented in Diagram 11. The best showing is made by electrical contracting, in which the average number employed is 93 per cent of the maximum working force, and the poorest by plastering in which the average is only 66 per cent of the maximum.

Health Conditions

Nearly all of the building trades are open air occupations, much even of the inside work being done before the buildings are closed in. For the most part the materials used are not injurious to health if reasonable precautions are taken and ordinary habits of cleanliness observed. In general, health conditions are better than those found in the factory industries.

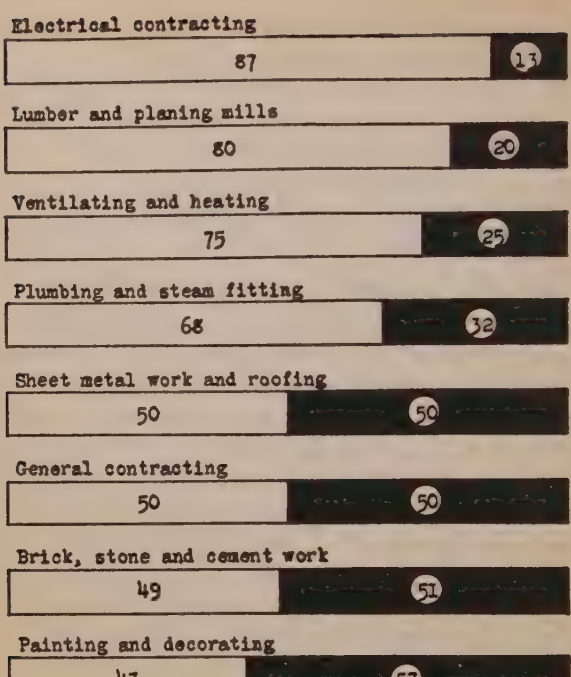

Diagram 11.—Sections in outline represent percentage of men employed, and sections in black percentage of men unemployed in each of nine building industries at the time when each industry showed the largest percentage of unemployment

Opportunities for Advancement

The building trades offer many opportunities for advancement. One reason for this is the large number

of supervisory positions made necessary by the wide range of building activities. A foreman in almost any of the trades must be able to read plans, as he must lay out the work. It is not necessary for him to be the most skilled mechanic in the force. Employers and superintendents say that in selecting foremen they lay about equal weight on skill and on ability to handle men.

As a rule, foremanship carries with it higher wages, although in some cases the pay is the same as that of the regular journeymen. The reward for the added responsibility comes in the form of steadier employment. It is not uncommon for a foreman to be hired on a salary basis and carried on the payroll throughout the entire year.

Small contracting offers another form of advancement. It requires but little initial investment to make a modest beginning, because individual workmen in the various building trades provide their own tools and no expensive machines are required. Comparatively little working capital is necessary, as provision is made in most contracts for part payments as the work progresses.

The Problem of Training

The recommendations of the report relating to training for the building trades may be summarized under five headings:

1. *Reduce retardation.* The first step in improving the educational preparation of workers entering the

building trades is to reduce retardation or slow progress in the elementary grades. At present it is approximately true of the men entering the building trades that one-third drop out of school by the sixth grade, two-thirds by the seventh grade, and three-thirds by the eighth grade. Now according to law a boy cannot go to work until he is 16, and if he has made normal progress he will have completed the eight grades of the elementary course before he has reached that age. In point of fact, many of these boys do not make normal progress through the grades and hence they reach the age of 15 before completing the elementary course. As a result they fall out of school without having had those portions of the work in reading, drawing, mathematics, and elementary science which would be of most direct use to them in their future work.

2. *General industrial courses in seventh, eighth, and ninth grades.* If retardation could be largely reduced in the elementary grades, industrialized courses could be properly introduced in the seventh, eighth, and ninth grades for boys intending to enter the building trades. The specific changes recommended include as their most important elements:

a. Increased training in industrial arithmetic beginning in the seventh grade.
b. Courses in industrial drawing.
c. Courses in elementary science relating to industry.
d. Courses in industrial information.
e. General courses in industrial shop work.

These are general industrial courses and it is recommended that they be introduced as prominent features of the work of the junior high school. They are not intended to take the place of specialized courses in the building trades, but they are proposed as courses valuable for all future industrial workers and within which certain adaptations should be made for those who are intending to enter the building trades.

3. *A two year industrial trade school.* In addition to the general industrial courses in junior high schools that have been recommended in the previous section, there should be established a two year industrial trade school for boys. It should receive boys 14 to 16 years of age who desire direct trade-preparatory training. There are good reasons why the present elementary schools, the proposed junior high schools, and the existing technical high schools cannot satisfactorily take the place of a specialized two year course in giving boys direct trade-preparatory education. Boys who go through the technical high schools do not remain in the building trades as artisans. This is shown by the fact that less than two per cent of the graduates of these schools are working in the building trades.

The elementary schools and the junior high schools cannot conduct satisfactory trade-preparatory courses for the building industry for the reason that they do not bring together at any one point a sufficient number of these future workers to make it possible to teach them economically. This is a con-

sideration which conditions every plan for the organization of industrial education. It is a question of the community's capacity to absorb workmen trained for any given occupation. In Cleveland about 4,000 boys leave the public elementary schools each year. Approximately 2,400 of them drop out of the elementary schools or leave after graduating from them, while the remaining 1,600 go on to high school. The future workers in the building trades will be largely recruited from the 2,400 boys who leave the elementary schools each year. Most of them range in age from 14 to 16 and in school advancement from the fifth to the eighth grades. They represent a cross-section of a large part of the city's adult manhood of a few years hence.

Now the census figures tell us that if present conditions maintain in the future only about 100 of the 4,000 boys leaving school each year will be carpenters. For the purposes of the present inquiry we may assume that these 100 future carpenters are to be found among the 2,400 boys who do not go on to high school. But Cleveland has 108 elementary schools and these 100 future carpenters are widely scattered among them. Even if we knew which boys were destined to become carpenters, and even if we knew when they would leave school, and even if we should decide to give them all trade preparatory education for the last two years of their school life, we should still have an average class in carpentry of only two boys in each elementary school. This is administratively and educationally impossible. For

similar reasons specialized trade preparatory classes in junior high schools would prove exceedingly difficult to organize.

The whole situation is changed, however, when we gather in a central school all these future artisans who have decided that they wish to prepare for specific trades. Under these conditions classes would be sufficiently large so that specialized training could be given and special equipment provided. This work would best be undertaken in a school entirely devoted to the purpose, but such courses might be organized in connection with the present technical high schools. This arrangement would be less desirable and probably give inferior results. The important point, however, is not so much the organization or curriculum for these classes, it is the fundamental fact that trade classes can be wisely organized only when a sufficiently large number of pupils can be gathered in one place so as to make the work efficient and economical.

The effectiveness of the trade-preparatory training recommended would be greatly increased if the upper limit of the compulsory attendance period for boys should be placed at 16 years instead of at 15 as it is now.

4. *Trade-Extension Classes for Apprentices.* At the present time the technical high schools offer evening classes for apprentices in the building trades. About one-seventh of the apprentices of the city are enrolled in these classes. In the main they are full grown men. In general they do not want shop work related to their own trades, but prefer instead to enroll in courses in drawing.

The considerations already presented bear in minor

degree on the problem of providing evening instruction for trade apprentices. The essential for efficient work is that a sufficient number of pupils be brought together so as to make it possible to organize specialized classes in different kinds of work that the pupils want and need. So long as there are only 50 apprentices enrolled in the entire city, and these represent a number of trades, many different stages of advancement, and a variety of needs, truly efficient work will be impossible. Better conditions can be brought about only through the coöperation of the unions, the employers, and the school people.

5. *Trade-Extension Work for Journeymen.* The evening technical schools now maintain shop classes and drawing classes for workers in the building trades. Less than one per cent of the workers in these trades are enrolled in these classes. There is little differentiation in the school work offered to helpers, apprentices, and journeymen. The result is that the work is much less efficient than it might well be. It cannot be rendered much more efficient than it is until the classes are increased in size and as a result the work differentiated and specialized. This type of improvement will result only from putting the night school work in the hands of skilful and well paid directors and teachers who bring to it a degree of energy, enterprise, ingenuity, and adaptability that it is unreasonable to expect and impossible to get from day school teachers who have already given the best that is in them to their regular classes and are giving a fatigued margin of work and attention to their night school pupils.

CHAPTER XVIII

SUMMARY OF REPORT ON RAILROAD AND STREET TRANSPORTATION

The report on railroad and street transportation takes up a class of wage earning occupations that give employment in Cleveland to approximately 15,000 men. A much larger proportion than is found in most other industrial manual occupations are natives of the city. Although some of the work is relatively unskilled, all of the different occupations have one common characteristic—the necessity for a knowledge of the English language and some acquaintance with local customs and conditions. For this reason comparatively few foreigners are employed.

The report takes up separately three types of workers, those employed in railroad train service, those engaged in wagon or automobile transportation, and the car service employees of the street railroad.

Railroad Transportation

The study covered only those railroad occupations that are directly concerned with the actual opera-

tion of trains, such as those of engineers, firemen, conductors, and trainmen. These occupations have many points in common and bring into play many similar mental and physical characteristics. The requirements for entrance are strict and examinations for the higher positions are obligatory. In all of them the hazards are great. Each occupation is firmly intrenched in trade unionism. Differences with employers relating to such matters as promotion, hours of labor, wages, and overtime are settled by collective bargaining or, in case of failure to agree, by arbitration proceedings.

The estimated number of men in Cleveland employed in these occupations in 1915 is approximately 4,500. Of these about one-fourth are switchmen and flagmen, one-fourth enginemen, one-fifth brakemen, one-sixth conductors, and one-eighth firemen.

The requirements for entrance call for a high degree of physical fitness. The applicant for employment must pass a severe examination as to vision and hearing, and in addition furnish certain data as to his family history, as it relates to insanity, tuberculosis, and certain other diseases. The high standard maintained insures a type of employees which for physical fitness, mental alertness, and ability to handle difficult situations is unsurpassed in any industry.

Frequent examinations, which are compulsory, are the stepping-stones to the higher positions. In this way a brakeman qualifies for the position of freight conductor, a freight conductor for that of

passenger conductor, and a fireman for a position as engineer.

Each of the two services, passenger and freight, has its advantages. In the passenger service the working day is short, with little overtime. Freight service requires a longer working day and a considerable amount of overtime. Promotions in both services and from one to the other are made on the basis of seniority.

Violation of the strict rules laid down for the operation of trains on the part of employees may result in reprimand, suspension, or dismissal, according to the gravity of the offense. The penalty of suspension has practically superseded the others except in extreme cases, such as drunkenness, theft, or other serious violations of the rules, for which offenders are summarily dismissed. On some railroads, a graded system of demerits is used. When an employee has received a certain number of demerits he is dismissed from the service.

The railroad unions are among the strongest and most aggressive in the country. The total union membership among train operating employees alone in the country is approximately 350,000. The unions are all modeled upon the same general plan. They are quite independent of each other, keep strictly to their agreements and oppose the sympathetic strike. They all maintain some form of life insurance. Four organizations have underwritten over $500,000,000 of insurance and one of them in a single year paid claims amounting to $1,135,000. The influence of

these unions has been particularly effective in securing the passage of protective state and national legislation such as full crew laws, standardization of train equipment, employers' liability laws, car limit laws, etc.

The hazardous nature of the work is indicated by a statement made by a prominent union official to the effect that the Trainmen's Brotherhood paid a claim for death or disability every seven hours. A report to the Interstate Commerce Commission states that there is one case of injury in train or yard service every nine minutes. With the invention of safety devices the risk of accident has been greatly lessened, but railroading is still one of the most dangerous industrial occupations.

There is little chance of employment for applicants under the age of 21 years. In fact, many roads refuse to employ men below this age. Physical or sense defects which often accompany advancing years, and which would not disqualify a man in other occupations do so in railroad work. The average length of the working life is a little over 12 years.

Railroad employees are among the best paid workers in the country. A close estimate based on extensive wage investigations places the annual earnings of engineers at from $1,200 to $2,400 a year, with an average of $1,600. Conductors average about $1,350, firemen a little over $900, and other trainmen about $950. The usual working day is 10 hours, although this is often exceeded. Overtime is paid

on a regular scale agreed upon by the companies and the union.

The educational requirements are not very exacting. A thorough grounding in the "three R's" is usually all that is necessary. A large amount of trade knowledge is obtained through contact and participation after entering employment and can be gained in no other way. The examinations for promotion are of a thorough-going character. One of the roads in Cleveland requires an examination of its firemen and trainmen six months after employment, as to vision, color-sense, and hearing. They must also pass an oral examination on the characteristics of their division and a written examination on certain set questions furnished them in advance. Two years later they are examined again, the fireman for engineman, and the brakeman for conductor. The scope of these examinations covers the whole range of train operating. Each of the five large railroads entering Cleveland has air-brake cars equipped with various forms of air brakes, air signals, pumps, valves, and injectors for the purpose of giving instruction to trainmen. A competent instructor is put in charge of these cars to explain the theory and practice of the apparatus and also to give instruction in any new type of engine or train equipment.

The conclusions of the report are in the main negative with respect to specialized vocational training in the public schools. There is no doubt that the general industrial course recommended for the

junior high school period in previous chapters would be of some value to boys who may enter this line of work. Problems of railroad transportation might well be included as part of the work in applied mathematics. What workers in these occupations need most, however, is a thorough elementary education.

Motor and Wagon Transportation

This section of the report takes up such occupations as those of teamsters, chauffeurs, and repairmen. There are no reliable data as to the number of men in the city employed in these occupations, but it is certain that it does not fall below 9,000. Notwithstanding the great increase in the use of automobiles and auto trucks in recent years the number of teamsters at the present time is in excess of 4,000 men. A very large proportion of the men employed in these occupations are of American birth.

The general conditions of labor such as wages, hours of labor, and so on, are the same for teamsters and chauffeurs. They earn about the same wages, belong to the same union, and work about the same hours. The wages range from 25 to 37 cents an hour. Earnings in the better paid jobs compare favorably with those in several of the skilled trades. Automobile repairmen earn from 30 to 45 cents an hour, and work from nine to 10 hours a day. The working day for teamsters and chauffeurs is somewhat longer, ranging from 10 to 12 hours. At the

present time these occupations are only partially organized in trade unions.

The report recommends the establishment of a course in automobile construction and operation in the technical high schools. In view of the constantly increasing use of automobiles such a course would be of value to many boys besides those who enter employment as chauffeurs and truck drivers.

Street Railroad Transportation

There are employed in Cleveland at present approximately 2,500 motormen and street car conductors. Almost all of them are of American birth, and the majority are natives of the city.

As in railroad work each applicant for employment must pass an examination, although the requirements are less exacting than those demanded in railroad work. The preliminary training occupies about 10 days, during which the motorman is taught by actual car operation how to operate the controller, how to apply and release the brakes, and other duties connected with the careful running of the car through crowded streets. The conductor is taught the names of the streets, how and when to call them, where stops are to be made, when to turn lights on and off, how to act in case of accidents, and the various duties which deal with the sale, collection, and reporting of transfers and tickets.

No one is admitted into the service before the age of 21 or after 35. Promotion usually comes in the

form of better runs. The chances of promotion to positions above the grade of conductor or motorman are very slight. About 90 per cent of the men belong to the local union. Union rates of pay for motormen and conductors are higher in Cleveland than in most cities in the country, in spite of the fact that this is the only large city in the country with a three cent street car far. The wages of both motormen and conductors are 29 cents an hour for the first year and 32 in succeeding years. The hours of labor are very irregular. The usual working day is from 10 to 12 hours.

The author of the report is of the opinion that no special instruction for this type of workers can be given by the public schools.

CHAPTER XIX

SUMMARY OF REPORT ON THE PRINTING TRADES

A smaller proportion of the industrial population in Cleveland is engaged in printing than in most large cities. The number of persons employed in printing occupations in 1915 is estimated at approximately 3,900, made up chiefly of skilled workmen. Little common labor is used in any department of the industry.

The business of printing is usually conducted in small establishments. There are not more than six plants in the city which employ over 75 wage earners. Data collected from 44 local printing shops, showed an average working force of only 36 persons. Due largely to this characteristic printing affords an unusual number of opportunities for advancement to the skilled workers in the industry. The smaller the establishments are the greater is the proportion of proprietors, superintendents, managers and foremen to the total number of wage earners. Ten per cent of the total working force in the printing industry is employed in supervisory and directive positions. In many of the large manufacturing industries of the city the proportion in such work is less than three per cent.

No other manufacturing industry employs so large a proportion of American born workers. In recent years many of the skilled industrial trades have been recruited to a very large extent from foreign labor,

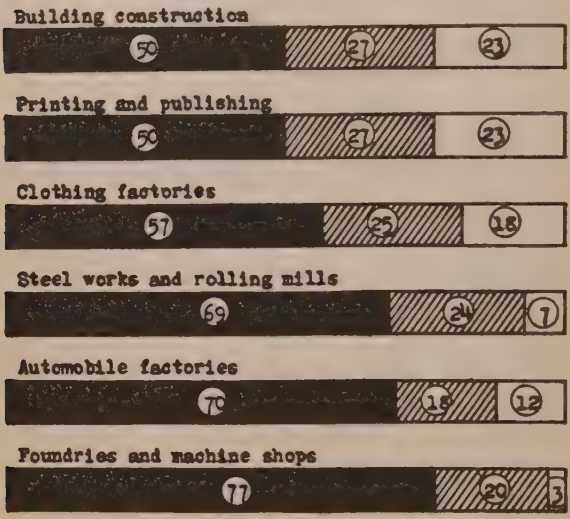

Diagram 12.—Number of men in each 100 in printing and five other industries earning each class of weekly wage. Black indicates less than $18, hatching, $18 to $25, and outline $25 and over

but in printing the American worker has so far held his own remarkably well. This is due in part to the relatively high wages and desirable working conditions and to the necessity in all branches of printing for a working knowledge of English.

Practically all of the trades are thoroughly organized. The unions are united in a body called the Council of the Allied Printing Trades. Although only about half of the shops in the city employ union labor exclusively, the union regulations as to wages and hours of labor are observed in both open and closed shops.

Printing workers are among the best paid industrial wage earners in the city. A comparison of the weekly earnings in the various manufacturing industries is shown in Diagram 12. This comparison is based upon the 1914 report of the Ohio Industrial Commission.

The comparison of the earnings of women in various industries, shown in Diagram 13, is less favorable to printing. On the basis of the proportion of women that earn $12 and over per week this industry takes third place. It should be noted, however, that nearly all the women employed are engaged in semi-skilled work in binderies,—a lower grade of work than that done by most women workers in clothing factories, where wages are higher. Compared with other occupations that require about the same amount of experience and training, in textile, tobacco, and confectionery manufacturing establishments, the wages of women employed in the printing industry are relatively high.

Wage earners in printing establishments lose less time through irregularity of employment than do those in most other factory industries. The kind of work done by women is more seasonal than that done

by men, although less so than in other manufacturing industries which employ large numbers of women.

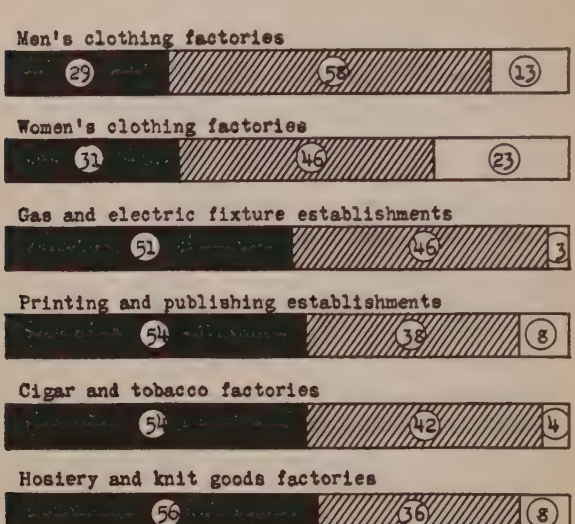

Diagram 13.—Number of women in each 100 in printing and six other industries earning each class of weekly wage. Black indicates less than $8, hatching $8 to $12, and outline $12 and over

Composing Room Workers

Nearly all the workers in this department of the industry are hand or machine compositors. Until about 30 years ago, before practical type-setting machines were invented, all type was set by hand. To-

day the hand compositor, except in very small shops, works only on jobs requiring special type and special arrangement, such as advertisements, title covers of books, letter heads, and so on.

In the city there are about 1,200 people employed in composing room occupations, or about 30 per cent of the total number of workers in the industry. This number includes some 50 women employed as proof-readers and copy-holders. Nine-tenths of the composing room workers are members of the International Typographical Union, although the number of shops that employ union men exclusively, called closed shops, approximates only one-half of the total number in the city. The remainder, while employing union labor, observing union hours, and paying union wages, reserve the right to hire non-union workmen.

Composing room workers are the best paid in the industry. A comparison of average wages in newspaper and job establishments is shown in Table 27.

TABLE 27.—AVERAGE DAILY EARNINGS OF JOB AND NEWSPAPER COMPOSING-ROOM WORKERS, 1915

Workers in trade	Job offices	Newspaper offices
Foremen	$5.19	$6.65
Linotype machinists	4.66	4.84
Proof-readers	4.63	3.98
Monotype operators	4.57	..
Linotypers	4.28	4.65
Monotype casters	3.96	4.30
Stonemen	3.94	4.89
Hand-compositors	3.48	4.58
Copy-holders	2.30	2.93
Apprentices	1.64	1.39

Compositors suffer most from the diseases that are common to indoor workers. The stooping position in which much of the work is done, together with insufficient ventilation and the presence of gases from the molten metal used in monotype and linotype machines, favors the development of lung diseases. The number of deaths from consumption among compositors is more than double that in most outdoor occupations.

The apprenticeship system has held its own in the compositor's trade better than in most industrial occupations. In the establishments visited by the Survey Staff there were approximately 15 apprentices to each 100 hand and machine compositors. As a rule there is no real system or method of instruction. The points principally insisted upon by the union, which strongly favors the apprenticeship system, are that the number of apprentices employed shall not exceed that stipulated in the agreement between the employers and the union, and that each apprentice shall be required to serve the full term of five years.

During the first and second years the apprentice is required to perform general work in the composing room under the direction of the foreman. In the third year he joins the union as an apprentice. The apprenticeship agreement stipulates that during this year he must be employed four hours each day at composition and distribution. In the fourth and fifth years the number of hours per day on such work is increased to six and seven respectively. During the last two years of his term he must take the even-

ing trade course given by the International Typographical Union, the expense of tuition being met by the local union. The agreement contains no stipulation as to wages for the first and second years. The wage for the third year is $9 a week, for the fourth year $12, and for the fifth, $15. Apprentices in newspaper composing rooms are permitted to spend the last six months of their period working on typesetting machines.

The Pressroom

The pressroom occupations include platen and cylinder pressmen, web or newspaper pressmen, platen and cylinder pressfeeders, plate printers, cutters, flyboys and apprentices. Approximately 15 per cent of the men employed are cylinder pressmen, about 10 per cent platen pressmen, and less than three per cent web pressmen. Pressfeeders comprise over 40 per cent of the whole group. Nearly nine-tenths of all pressroom workers are employed in job establishments. Five occupations—those of cutters, floormen, flyboys, plate printers, and web pressmen—give employment to fewer than 40 men each.

The average daily earnings of pressroom workers in the establishments from which wage data were collected during the survey are shown in Table 28.

The hourly rates of pay are high as compared with those in other occupations requiring an equal or greater amount of skill and knowledge. Cylinder pressmen earn more per hour than do tool and die makers—the most highly skilled of the metal trades

—and platen pressmen in charge of five or more presses earn more than all-round machinists and boiler makers. The rate for cylinder pressfeeders is about three cents an hour higher than that received for specialized machine work in the metal trades.

TABLE 28.—AVERAGE DAILY EARNINGS OF PRESSROOM WORKERS, 1915

Job pressroom workers	
Foremen	$4.78
Cylinder pressmen	3.63
Cutters	3.41
Platen pressmen	2.97
Floormen	2.91
Cylinder pressfeeders, men	2.54
Cylinder pressfeeders, women	1.77
Platen pressfeeders, men	1.83
Platen pressfeeders, women	1.70
Flyboys	1.56
Newspaper pressroom workers	
Foremen	6.11
Web pressmen	4.33
Web pressmen's assistants	2.95

Formal apprenticeship is practically unknown. The boy begins as a pressfeeder, usually on a platen press, and in the course of time gets to be a platen pressman. A knowledge of platen presswork does not qualify a man to run a cylinder press, and as a rule the platen pressman who wants to change must serve some time as a cylinder pressfeeder and cylinder pressman's assistant. There is no organized system for training beginners. The boy who wants to become a pressman must pick up the trade through experience and practice, the length of time required depending chiefly on how frequently changes occur among the force of pressmen employed in the shop.

The Bindery

The bindery is the only department of the industry in which any considerable number of women are employed. Some of the occupations, such as gathering, sewing, and stitching, are practically monopolized by women. They are also employed extensively in hand and machine folding. About one-fifth are gatherers and one-fifth sewers and stitchers. The other three-fifths are distributed among a number of occupations usually classed as general bindery work.

The occupations in which men predominate are forwarding, ruling, and finishing, and cutting. The forwarders comprise more than one-fourth of the total number of men engaged in bindery work. The other two skilled trades—ruling and finishing—give employment to about 35 men each.

The average daily earnings in the various occupations, based on returns from 44 establishments, were as shown in Table 29.

TABLE 29.—AVERAGE DAILY EARNINGS OF BINDERY WORKERS, 1915

Workers in trade	Men	Women
Foremen	$4.78	$2.05
Rulers	3.56	..
Finishers	3.51	..
Forwarders	3.23	..
Cutters	3.21	..
Machine-folders	2.81	1.49
Wire-stitchers	..	1.57
Apprentices	1.53	..
Gatherers	..	1.52
Sewers	..	1.52
Other bindery operatives	1.40	1.51

On account of the seasonal character of the work considerable time is lost through unemployment, particularly in those occupations in which women predominate.

Beginners in these occupations in which the majority of the women are employed, start on folding or pasting, and as opportunity presents, gradually acquire practice in the higher grades of work, such as gathering and machine operating. There are some traces of the apprenticeship system in forwarding, ruling, and finishing, but these trades are so small that all of them combined require only a very few new workers each year.

Other Occupations

Other departments of the printing industry are photoengraving, stereotyping, electrotyping, and lithographing. They give employment to approximately 700 workers, distributed among more than 20 distinct trades, requiring the most diverse sorts of skill, knowledge, and training. There are about 100 men in the city engaged in the different processes of photoengraving. Nearly all of the stereotypers, numbering from 60 to 70, are employed in newspaper offices. There are about 125 electrotypers and 400 lithographers. The labor conditions closely approximate those found in other departments of the industry. Average wages for the different occupations are shown in Table 30.

TABLE 30.—AVERAGE DAILY EARNINGS IN PHOTOENGRAVING, STEREOTYPING, ELECTROTYPING, AND LITHOGRAPHING OCCUPATIONS, 1915

Workers in trade	Average daily earnings
Photoengraving	
Artists	$6.32
Photographers	4.69
Etchers	4.52
Routers	4.25
Finishers	4.21
Proofers	3.69
Strippers	3.61
Blockers	2.36
Apprentices	1.49
Art apprentices	1.27
Stereotyping	4.00
Electrotyping	
Molders	4.41
Finishers	4.01
Casters	3.18
Routers	3.17
Builders	3.13
Blockers	2.05
Batterymen	1.97
Case fillers	1.59
Apprentices	1.10
Lithographing	
Lettermen	6.63
Artists	6.41
Pressroom foremen	5.80
Grainers	4.73
Engravers	4.35
Pressmen	3.91
Transferers and proofers	3.41
Pressroom apprentices	2.80
Tracers	2.63
Stone polishers	2.53
Pressfeeders	1.72
Other apprentices	1.59
Artist apprentices	1.23
Flyboys	1.10

There is no well organized system for training apprentices in photoengraving, stereotyping, and electrotyping, or in any of the lithographic trades, except that of poster artist, in which an efficient and strictly regulated system of apprenticeship is maintained.

The Problem of Training

The report maintains that up to the end of the compulsory attendance period school training preparatory to entering the printing trades must be of the most general sort, due to the fact that in the average elementary school the number of boys who are likely to become printers is too small to form special classes. For example, in an elementary school of 1,000 pupils the number of boys 12 years old and over to whom instruction in printing would be of value from the standpoint of future vocational utility, would probably not exceed two. While admitting the advantages of the junior high school for the purposes of vocational training, the report points out that even in a school where only pupils of the upper grades are admitted, the number who are likely to become printers is still too small to warrant special instruction. In a junior high school of 1,000 pupils not more than nine boys are likely to become printers.

The report recommends a general industrial course during the junior high school period. What the boys need at this time is practice in the application of mathematics, drawing, and elementary science to industrial problems. Shop equipment should be

selected with this object in mind. It is doubtful whether it should include a printing shop, for while such a shop would be useful to the few boys who will become printers, it would be of little value in training for other industries. The report suggests as subjects which should be included in the general industrial course practice in handling and assembling machinery, the study of color harmony, and the principles of design in connection with the work in drawing, the use of printing shop problems in applied mathematics, and thorough instruction in spelling, punctuation, and the division of words. It also recommends the course of industrial information referred to in previous chapters.

The establishment of a two year printing course in a separate vocational school is recommended to meet the need for specialized instruction from the end of the compulsory period to the apprentice entering age. The printing trades are relatively small and it is only by concentrating in a single school plant all the boys who may wish to enter them that specialized training can be made practicable. In this way it would be possible to secure classes of from 60 to 100 boys each for such trades as composition and presswork. The report emphasizes the need for instruction in trade theory as against practice on specific operations. It points out that the boys will have plenty of opportunity after they go to work to acquire speed and manual skill, while they have little chance, under modern shop conditions, to obtain an understanding of the

relation of drawing, physics, chemistry, mathematics, and art to their work.

The only trade extension training offered by the public schools at the present time is that given in the technical night schools. During the second term of 1915–16 there were 28 persons enrolled in the technical night school printing class. Of these 28 persons three were journeymen printers, five described themselves as "helpers," 11 were apprentices, one was employed in the office of a printing establishment, and eight were engaged in occupations unrelated to printing. No special provision is made for the apprentices. The course, which includes hand composition, a little press work, and lectures on trade subjects, is planned "to help broaden the shop training of those working at the trade" That it does so to any considerable extent is doubtful. Too much of the time is devoted to hand work and practice on operations which the boys can easily learn in the shops. It is believed that the plan followed in the evening apprentice course prescribed by the International Typographical Union, in which no shop equipment or apparatus is used, is better adapted to the needs of boys employed in the trade. The course consists of 46 lessons in English, lettering, design, color harmony, job composition, and imposition for machine, and hand folding. The classes are taught by journeymen teachers. In February 1916 about 100 students were enrolled, of whom approximately one-third were apprentices and two-thirds journeymen.

CLEVELAND EDUCATION SURVEY REPORTS

These reports can be secured from the Survey Committee of the Cleveland Foundation, Cleveland, Ohio. They will be sent postpaid for 25 cents per volume with the exception of "Measuring the Work of the Public Schools" by Judd, "The Cleveland School Survey" by Ayres, and "Wage Earning and Education" by Lutz. These three volumes will be sent for 50 cents each. All of these reports may be secured at the same rates from the Division of Education of the Russell Sage Foundation, New York City.

Child Accounting in the Public Schools—Ayres.
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